

BOTANISKA NOTISER

SUPPLEMENT VOL. 3:3

Utgivare: LUNDS BOTANISKA FÖRENING

Redaktör: H. HJELMQVIST

MONOGRAPH OF THE
GENUS RUMEX IN AFRICA

VORARBEITEN ZU EINER MONOGRAPHIE
DER GATTUNG RUMEX VIII

BY

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DISTRIBUTÖR:

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LUND 1954

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The African flora, with 47 species of *Rumex*, is relatively poor in comparison with that of Asia, with 72 species. Twenty-six of the African species are endemics and 21 are spread over two or more continents. Of the latter 17 are indigenous in Africa and only a possible three (one certainly) species are introduced weeds from outside the continent.

The major botanical regions of Africa (HUTCHINSON, A Botanist in Southern Africa, p. 19, 1946) have the following representation of endemic and widely distributed species of *Rumex*. The Mediterranean region (used in the broadest sense to include the Atlas range, the Sahara and Macaronesia) is the richest, with 14 endemics and 14 non-endemics. The Tropical African region is the poorest in *Rumex*, with 5 endemics and 2 non-endemics. This fact corresponds well with the situation in America and Asia where *Rumex* is equally poorly represented in the tropics. The Subtropical South African and the Cape regions, although they are so distinct, may be considered together for this purpose, with 7 endemics and 5 non-endemic weedy species brought in by man.

It should be stressed that the most common and most polymorphic species of *Rumex* in South Africa, *R. lanceolatus* THUNBG., and two others, *R. spathulatus* THUNBG. and *R. rhodesius* RECH. FIL., belong to sect. *Axillares* which has its center of evolution in America (cf. Vorarb. V, Field Mus. Bot. 17, 1937¹) and is entirely lacking in Europe and in Western and Central Asia. Accordingly, these species furnish a new example of the much discussed phytogeographic connections between

¹ The present paper is to be regarded as »Vorarbeiten zu einer Monographie der Gattung *Rumex* VIII». Previously the following contributions have appeared:

Vorarbeiten I: Beih. Bot. Centrbl. 49/2 (1932); II: Fedde Repert. 31 (1933); III: Arkiv för Bot. 26 A, 3 (1933); IV: Oesterr. Bot. Zeitschr. 84 (1935); V: Field Mus. Bot. 17, 1 (1937); VI: Botaniska Notiser (1939); VII: Candollea 12 (1949).

Beiträge: I: Fedde Repert. 26: 177 (1929); II: Lc. 27: 385 (1930); III: Lc. 29: 246 (1931); IV: Lc. 33: 353 (1934); V: Lc. 38: 49 (1935); VI: Lc. 39: 169 (1936); VII: Lc. 49 (1936); VIII: Lc. 49 (1940); IX: Candollea 11 (1948); X: Oesterr. Bot. Zeitschr. 99 (1952).

Africa and America. The Central African *R. ruwenzoriensis* also belongs to sect. *Axillares*.

Another interesting fact is that the subgenus *Acetosa* has nearly as many representatives as the subgenus *Lapathum* in Africa, whereas on all other continents *Lapathum* is much richer in species than *Acetosa*.

The species of *Rumex* occurring in Africa may be assigned to the following geographic area groupings.

1. Cosmopolitan or nearly so: *R. angiocarpus*, *R. crispus*. Probably both species owe their present large distributions to the influence of man. Their original areas cannot be stated definitely. *R. crispus* originates very probably from the northern temperate zone or from its Eurasiatic part. The natural center of distribution of *R. angiocarpus* can be recognized more closely, i.e. the western part of Europe and the Mediterranean region. The same aggressive tendencies can be recognized in *R. conglomeratus* and *R. obtusifolius* ssp. *agrestis*, both originating in Europe and Western Asia and extending from there to the other continents but not so well established nor so common as *R. crispus* and *R. angiocarpus*.

2. Mediterranean: Most of the African species belong to this distributional group, which can be subdivided as follows:

a.) species distributed over all or a great part of the Mediterranean region, partly extending into neighboring districts: *R. scutatus*, *R. bucephalophorus*, *R. pulcher*, *R. dentatus*.

b.) western or southwestern Mediterranean species: *R. Aristidis*, *R. atlanticus*, *R. induratus*, *R. intermedius*, *R. thyroides*, *R. tingitanus*, *R. pictus*, *R. bipinnatus*, *R. Papilio*, *R. Ginii*, *R. algeriensis*, *R. tunetanus*, *R. aegyptiacus*, *R. brachypodus*.

c.) Macaronesian species: *R. maderensis*, *R. Lunaria*, *R. azoricus*, *R. Caldeirarum*.

3. Saharo-Sindian: *R. vesicarius*, *R. simpliciflorus*, *R. cyprius*.

4. Asiatic: *R. nepalensis*.

5. Central European: *R. palustris*.

6. Eastern and Central African: *R. trinervius*, *R. nervosus*, *R. Ellenbeckii*, *R. abyssinicus*, *R. ruwenzoriensis*, *R. Steudelii*, *R. Bequaertii*.

7. South African: *R. lativalvis*, *R. cordatus*, *R. sagittatus*, *R. Woodii*, *R. garipensis*, *R. lanceolatus*, *R. spathulatus*, *R. rhodesius*.

8. South American: *R. cuneifolius*.

MEISNER in his treatment of the genus *Rumex* in DE CANDOLLE's *Prodrum* 14 (1856) indicates the following 37 species from Africa:

Valid names are marked with »!», doubtful names or doubtful references for Africa with »?»; for synonyms the valid name is added.

- maximus* SCHREB.?
sanguineus L.?
Ecklonii MEISN. = *lanceolatus* THBG.
Meyerianus MEISN. = *lanceolatus* THBG.
spathulatus THBG.!
lanceolatus THBG.!
linearis CAMPD. = *lanceolatus* THBG.
sylvestris WALLR. = *obtusifolius* L. ssp. *agrestis* (FR.) DANS.
Patientia L.?
obtusifolius L. = *obt.* ssp. *agrestis*
nepalensis SPR. = *Stuedelii* HOCHST.
Stuedelianus MEISN. = *Stuedelii* HOCHST.
Ehrenbergii MEISN. = *dentatus* L. ssp.?
dentatus L.!
callosissimus MEISN. = *dentatus* L. ssp. *callosissimus* (MEISN.) RECH. FIL.
pulcher L.!
garipensis MEISN.!
comosus FORSK. = *aegyptiacus* L.
bucephalophorus L.
fimbriatus POIR.?
Acetosella L.!
Acetosa L.!
thyrsoides DESF.!
tingitanus L.!
Schimperi MEISN. = *abyssinicus* JACQ. var. *Schimperi* (MEISN.) RECH. FIL.
maderensis LOWE!
lativalvis MEISN.!
Dregei MEISN.?
sagittatus THBG.!
cordatus DESF.!
abyssinicus JACQ.!
lacerus BALB. = *pictus* FORSK.
scutatus L.!
vesicarius L.!
roseus L. = *cyprius* MURB.
frutescens PETIT-THOUARS = *cuneifolius* CAMPD.
Lunaria L.!

The collections studied are from the same herbaria as in previous contributions. I wish to express again my gratitude to the curators and staffs of all these herbaria, at several of which I had the privilege of studying in person. Thanks to a Fulbright scholarship and to a grant

offered by The New York Botanical Garden I was able to complete the manuscript there with MEISNERS type specimens before me. I owe special thanks to Dr. D. D. KECK, Head Curator at The New York Botanical Garden, who so willingly assisted me with the English text.

The text of the labels on the specimens cited is quoted in the original language. I have used the standard abbreviations (to be found in Index Herbariorum) for the herbaria consulted.

Subgenus I. *Acetosella*.

(MEISN., ap. DC. Prodr. 14: 63, 1856, pro sect.) RECH. FIL. in Field Mus. Bot. 17, no. 1: 6, (1937).

Flores dioici (rarissime polygami); perigonii florum femineorum folia interiora fructificationis tempore non vel paulo tantum dilatata, nuce ad summum duplo maiora, omnino ecallosa. Folia plerumque hastata vel sagittata.

1. *Rumex angiocarpus* MURB.

MURB. in Beitr. Fl. Südbosn. in Lunds Univ. Årsskr. 27: 46 (1891); LÖVE in Bot. Notis. 1941: 158 (1941); LÖVE in Hereditas 30: 4 (1944); RECH. F., Candollea 12: 16 (1949). *R. Acetosella* L. ssp. *angiocarpus* MURB. in Bot. Notis. 1899: 42 (1899). *R. Acetosella* auct. afr., fide LÖVE.

Perennis, saepe pluricaulis. *Caules* 15—50 cm alti, tenues, erecti vel rarius ascendentes, numquam procumbentes; inflorescentia e ramis tenuibus erectis vel patentibus vel arcuatis, simplicibus vel in specimenibus validis iterum ramosis aphyllis composita, plerumque dimidium vel tertiam partem caulis occupans. *Folia* omnia canescenti-virentia vel subglaucescentia, in vivo crassiuscula; costa mediana tenuis, nervis lateralibus evanescentibus, glabra, rarius obsolete papillosa, plana; rosularum sterilium et caulina inferiora forma et magnitudine valde variabilia lobis exclusis latitudine plerumque 3—4-plo longiora aut hastato-lanceolata, aut latius vel angustius scutato-hastata, apice acuta vel obtusiuscula laciniis basalibus integris acutis lanceolatis vel linearibus divergentibus rarius obliquis, interdum in lacinias angustas palmato-fissis; petiolus laminam plerumque subaequans. Folia caulina parum decrescentia, proportione plerumque angustiora, lobis basalibus minoribus usque deficientibus, omnia longiuscule petiolata. *Ochreae* tenuiter membranaceae, hyalinae, maiusculae, diu persistentes. Florum glomeruli pauciflori remotiusculi, omnes aphylli. *Flores* dioici. *Pedicelli* tenues

perigonio plerumque breviores, supra medium articulati. *Perigonii foliola exteriora* oblongo-lanceolata, basibus interiorum appressa, ca. 0.5—0.7 mm longa. *Valvae* fructiferae cum nuce arcte connatae eam magnitudine exacte aequantes, obsolete nervosae, ecallosae. *Nux* 1 mm longa, \pm 1 mm lata, acute triquetra, saepe longitudini aequalata, interdum latior quam longa, infra medium latissima.

Distr.geogr.: Asia (Insulae japonicae), Europa australis et occidentalis, America borealis (sat copiose), praeterea per Americam centralem et australem, Africam australem, Australiam dispersus ibique verosimiliter introductus.

Morocco.

Cap Spartel (GANDOGGER s.n., LD). Atlas medius, prope pagum Azrou, in margine subhumida viae, ca. 1280 m (H. LINDBERG 4019, LD).

South Rhodesia.

Distr. Inyanga: In open grassland above Mororo-River (G. M. RATTRAY 978, PRE); In orchard irrigated occasionally, 2000 m (EYLES 8477, K); 3 km occidentem versus a monte Inyangani in solo humido (FRIES, NORLINDH, WEIMARCK 3463, LD).

Transvaal.

Belfast, common by station (J. BURTT-DAVY 1465, PRE). Benoni (R. D. BRADFIELD 164, PRE). Bethel-Station (..... 1300, PRE). Carolina Commonage (J. C. SMUTS, PRE); Carolina (J. BURTT-DAVY 7398, PRE); ibidem. Bushmans River Valley, 1850 m (E. E. GALPIN 13512, PRE). Ermelo, Nooitgedacht, in vleis, frequent (M. HENRICI 1305, PRE), ibidem, found on open veld, common (Pupils of Convent 119, PRE), ibidem, plentiful in lands, up to 1 ft. high, probably a source of food of the gerbil rodent (R. A. DYER 4148, PRE). Johannesburg, Bezuidenhout Valley (F. GILLILAND 7235, GRA, K, PRE); ibidem, Rosebank (F. FRIES 5349, LD); Johannesburg, Mine dumps (Cyanide sand) at base; also a weed of old cultivated land, very plentiful on the farm »The Patch«, Elandsfontein, 1900 (A. O. D. MOGG 16841, PRE). Lichtenburg, Grasfontein, klipveld, red sand, 1700 m (J. D. SUTTON 476, PRE). Pilgrimsrest, Mount Anderson, 1350 m (SMUTS & GILLET 2408, PRE). Standerton, Beginsel Farm (J. BURTT-DAVY 1797, PRE). Volksrust, Wakkerstroom-Distr. (MOGG 9684, PRE). Losberg, Potchefstroom Elandsfontein (J. J. THERON 731, NH.).

Natal.

Durbanville (DE JONGH 4933, GRA, PRE). Utrecht, Farm Glen Atholl near Charlestown and Volksrust, 6000 ft (C. A. SMITH 5739, PRE). Estcourt Tabamhlope P. R. Station, 30 miles W of Estcourt, 5500 ft (L. E. CODD 2449, PRE). Prospect near Red Hill (H. M. L. Forbes 372, NH.). (J. Thode 25912, NH.)

Basutoland.

Basutoland (R. R. STAPLES 71, PRE). Kahlers Mill, 1800 m (A. F. GUIL-LARMOD 362, PRE). Léribé (DIETERLEN 740, P; idem 762, PRE). Grachas hek, 7000 ft. (HOUSTON 22309, NH.).

Orange Free State.

Bethlehem, Railway enclosure, grassy places, 1700 m (E. P. PHILIPPS 3210, PRE); Bethlehem, Embankments of Bethlehem—Kroonstad railway (T. POTGIETER 23, PRE); Tamlungshop, Treveham Siding, via Bethlehem (F. P. OBERHOLZER s.n., PRE). Ficksburg, Rivenhill Farm, a weed of cultivation (G. POTTS 3722, PRE). Harrismith (G. V. SMIT 87, PRE). Orange River Colony (NEETHLING 4159, PRE).

Cape Province.

In summo monte Boschberg, 1550 m (M. OWAN 1476, GRA). Cap (ZEYHER 3621, PRE). Capetown (H. HUTTON 1893, GRA). Albany, 3 miles W of Cold-spring, grassveld along railway line, 1350 m (R. STORY 285, PRE). East London, fairly common on flats amongst grass »Overton«, 11 miles W of East London (H. O. HILNER 157, GRA); East London, Selbourne (C. A. SMITH 3695, PRE). Grahamstown, railway line near the tunnel (M. DALY 869, PRE). Herschel, Majuba Nek, Sterkspruit (J. HEPBURN 188, 277, GRA). Hofmans Bosch, cultivated land (BUTTEN 1051, GRA). Humansdorp, flats, Witte Els Bosch (H. G. FOURCADE 994, GRA). Kareedouw (THODE 2593, PRE). Kermansdorp, common on veld, which has been under cultivation, duine veld at Slang River (E. P. PHILIPPS 3427, PRE). Kimberley, road-side on the town (M. UITMAN 1198, KMG). Knysna, by road side (A. S. WILLIAMSON 162, GRA). Mt. Currie, common on stream banks and along streams (A. P. GOOSSENS 348, PRE). Distr. Maclear (D. MURRAY 16, GRA; WALMER). Port Elizabeth (J. V. PATERSON 790, GRA), *ibidem*, Theescombe (F. R. Long 1113, GRA, PRE). Rondebosch, between Constantia and the Steen Bergen, 358 m (DRÈGE 8036, K, US). Stellenbosch, a common weed (S. GARSIDE 1125, K). Distr. Stocken-stroom, Katberg, growing naturalised in moist places both in Hogsback and Katberg (R. A. DYER 7049, GRA, PRE), *ibidem*, alongside road, amongst damp rock, 2000 m (S. SCHONLAND 4289, GRA). Stutterheim, 3 miles Amabele in fallow lands, not common (DE VRIES 39, GRA). Stellenbosch-Van der Stel, along Railway Line, 40 m (C. A. SMITH 3215, PRE). Waste ground at Westerford (A. H. WOLLEY 1896, K). Xalanga, Cala (A. PEGLER 1683, PRE); Cala near Ngquangunder Stream (KOLBE & PEGLER, GRA). Zitzikama, Storms River, 200 m (E. E. GALPIN 4430, GRA, PRE). Mafeking, 1700 m (G. GERSTNER 246, PRE).

Bourbon.

Bourbon (I. B. BALFOUR s.n., K).

Gran Canaria.

Oberhalb Moya, 450 m (FLEISCHER 396, 397, 398, U).

Madeira.

Madeira, Mountain pastures, 1350 m, in the Ribeira d'Escalas (LOWE 517, K).

St. Helena.

St. Helena (BURCHELL 98, K).

Tristan da Cunha.

Tristan da Cunha, Up mt. about 1 mile south of the Settlement, perennial, rare in the area (R. A. DYER 3580, PRE); Tristan da Cunha (SAUNDERS s.n., MOSELEY s.n., MCGILLIVRAY s.n., K).

There has been much disagreement about the status of *R. angiocarpus*. I am following here the argumentation of LÖVE (1941), who has pointed out that the four species of Subgen. *Acetosella* accepted by him, *R. angiocarpus* ($2n = 14$), *R. tenuifolius* ($2n = 28$), *R. Acetosella* s. str. ($2n = 42$), and *R. graminifolius* ($2n = 56$) form a series of polyploids. Besides the chromosome number there are certain morphologic characters by which these species can be recognized. *R. angiocarpus* has the valves closely appressed to the nuts, the average size of cells is the smallest of the whole group, and the anthers and nuts are smaller, the latter being proportionally broader. With the exception of the rare high montane *R. atlanticus*, all African material distributed as *R. Acetosella* belongs to *R. angiocarpus*. It is possibly spontaneous in the Mediterranean portion of Africa, but elsewhere on the continent it is an introduced and troublesome weed as in some parts of South Africa.

2. *Rumex atlanticus* COSS.

COSS. in Batt. Contr. Fl. Atl. 1919: 79 (non vidi) et ap. Maire, Bull. Soc. Hist. Nat. Afr. Nord 26: 227 (1935) descr.!

Rhizoma verticale crassum atrum lignosum surculos numerosos steriles et floriferos emittens, caespites compactos efficiens. *Caules* floriferi ascendentes vel erecti, pumili, 2—6 cm longi, paucinodi subaphylli vel folio unico minuto lineari-lanceolato basin inflorescentiae fulcrante provisi. Collum residuis basium petiolorum \pm comosum. *Ochreae* basales hyalinae lanceolato-lingulatae acutae, numerosae, saepe elongatae ± 5 mm longae. *Folia basalia* rosulata numerosa, elliptico- usque lanceolato-spatulata; petioli 0.5—1.5 cm longi latiusculi, in basin laminae \pm sensim dilatati; lamina 3—7 mm longa, 3—6 mm lata, plana, integerrima, apice acuta, consistentia ut videtur in vivo carnosula in sicco crasse membranacea, praeter costam medianam tenuem subnervis, in sicco atroviridis. *Inflorescentia* 1—2(—3) cm longa, aphylla, verticillastris multifloris approximatis racemum subsimplicem vel inferne breviter pauciramulosum tunc ibique laxiusculum formans. *Pedicelli* florem

aequantēs usque superantes, flores masculi quam feminei plerumque longius pedicellati. Planta dioica. Sapor acidus. Perigonii foliola exteriora 0.6—0.7 mm longa, basibus interiorum appressa. *Valvae* fructiferae ± 1.6 mm longae, ± 1.2 mm latae, ovatae, nervo mediano tenuiter ramuloso, nuci appressae eamque aequantes. *Antherae* ± 1 mm longae. *Nux* ± 1.5 mm longa, 1.1—1.2 mm lata, fusca.

Algier.

Grand Atlas, Tifenout: pozzines sous le Tizi-n-Tagherat, porphyres, 3350 m (E. MAIRE s.n., LD.).

Morocco.

In rupestribus cacuminis montis Tidiguin (Atlante riphæo), solo silic., 2400 m (FONT QUER 1929: 106, S); Djebel Erdouz, flat plateau, slaty scree, 3550 m (BALLS B. 2843, S); Djebel Toubkal, 3450 m, Tarf slopes and among rocks (BALLS B. 2876, S).

»Habitat in pascuis alpinis Atlantis Majoris, solo siliceo vel decalcificato, ad alt. 2800—3500 m: in montibus ditium Seksaoua, Goundafa, Reraya, Ourika, Tifnout; in montibus Aouljdid, Masker, Mgoun, Ayachi, etc. Provenit porro in rupestribus excelsioribus arenaceis Atlantis Rifani: in cacumine montis Tidighin, ad alt. 2400—2450 m. A Julio usque ad Septembrem floret.» (MAIRE l.c.)

LÖVE (Bot. Notis. 1941 and Hereditas 30, 1944) in his treatment of Subgen. *Acetosella* has not dealt with this species. From a morphologic standpoint it is completely isolated from the four other species. From a geographic and ecological standpoint it deserves special interest as the only species of the subgenus strictly limited to a relatively small area in the high mountains. It should be interesting to study the cytology of this species, the four others of the subgenus forming a series of polyploids with the basic number $n=7$.

Subgenus II. *Acetosa*.

(CAMPD. Monogr. Rum. 1819 p.p.; MEISN. ap. DC. Prodr. 14: 64, 1856 pro sect.) RECH. F. in Field Mus. Bot. 17, no. 1: 6 (1937).

Flores dioici vel polygami rarius monoici. Perigonii florum femineorum folia interiora fructificationis tempore nuce deinde pluries maiora ecallosa vel basi callo minuto saepe recurvo praedita. Folia in multis speciebus hastata vel sagittata.

Clavis specierum.¹

1 a)	Plantae perennes	2
1 b)	Plantae annuae	17
2 a)	Frutices vel suffrutices	3
2 b)	Perennes ad summum basi lignescentes	8
3 a)	Folia nervis tribus parallelis distinctis percursa (confer <i>R. Ellenbeckii</i>)	4
3 b)	Nervatura foliorum pennata vel pennato-subpalmata	5
4 a)	Folia basi cuneata	<i>R. nervosus</i>
4 b)	Folia basi hastata	<i>R. trinervius</i>
5 a)	Valvae ecallosae	6
5 b)	Valvae callum minutum reflexum ferentes	7
6 a)	Frutex multicaulis ramis virgatis breviarticulatis. Folia omnia anguste linearia ad 2 mm lata	<i>R. Aristidis</i>
6 b)	Suffrutex ramis flexuosis vel strictis longe articulatis. Folia scutata vel hastata multo latiora	<i>R. maderensis</i>
7 a)	Folia longitudine saepe latiora late ovato-spathulata	<i>R. Lunaria</i>
7 b)	Folia anguste lineari-lanceolata	<i>R. Ellenbeckii</i>
8 a)	Perigonii foliola exteriora reflexa basi connata	9
8 b)	Perigonii foliola exteriora libera	10
9 a)	Folia inferiora scutato-hastata latitudine 3—4-plo longiora. Valvae ad 6 mm longae ad 9 mm latae	<i>R. thyrsoides</i>
9 b)	Folia inferiora lineari-hastata latitudine 6—10-plo longiora. Valvae 3—4 mm longae et latae	<i>R. intermedius</i>
10 a)	Valvae callo minuto reflexo praeditae	11
10 b)	Valvae ecallosae	12
11 a)	Caulis scandens. Valvae 4—7 mm longae, 6—9 mm latae	<i>R. sagittatus</i>
11 b)	Caulis erectus nunquam scandens	13
12 a)	Caulis elatus (50 cm—)1(—4) m altus. Folia polymorpha, vario modo hastata vel sagittata. Perigonii foliola exteriora valvis accumbentia. Valvae (3.5—)4—5(—7) mm longae et latae	<i>R. abyssinicus</i>
12 b)	Caulis ad summum 70 cm altus. Folia basi cuneata. Perigonii foliola exteriora reflexa. Valvae (8—)9—10 mm longae, 10—12 mm latae.	<i>R. Woodii</i>
13 a)	Rhizoma caudices ± elongatus emittens nunquam tuberosum	14
13 b)	Rhizoma vel radice fibrae pro parte quidem incrassatae	16
14 a)	Valvae 9—11×10—13 mm. Ochreae regionis inflorescentiae conspicuae, persistentes	<i>R. tingitanus</i>
14 b)	Valvae ad summum 7×9 mm. Ochreae omnes evanescentes	15
15 a)	Rami inflorescentiae demum indurati. Valvae 7×9 mm, basi anguste profunde emarginatae	<i>R. induratus</i>
15 b)	Rami inflorescentiae non indurati. Valvae 4.5—6×5 mm, basi cordatae.	<i>R. scutatus</i>

¹ »Folia» in the key refers always to basal or lower cauline leaves; »valvae» refers to those in the entirely ripe fruit.

- 16 a) Folia late ovato-cordata, lobis basalibus saepius rotundatis *R. cordatus*
 16 b) Folia hastata, lobis basalibus perlongis saepe fere rectangulariter patentibus.
R. lativalvis
- 17 a) Valvae in tertia circiter parte anteriore utrinque profunde anguste incisae.
R. Papilio
- 17 b) Valvae cordatae basi tantum emarginatae 18
- 18 a) Valvae nervo marginali continuo cinctae, saepissime minute spinulosae.
R. cyprius s.l.
- 18 b) Valvae nervo marginali continuo carentes 19
- 19 a) Pedicelli in ochrearum axillis singuli, flores saepissime binos proferentes.
 Folia semper integra 20
- 19 b) Pedicelli in ochrearum axillis plures. Folia saepe lobata 21
- 20 a) Valvae floris primarii subaequales, longitudinaliter complicatae, calli et flores
 secundarii et tertiarii ideoque omnino occulti *R. vesicarius*
- 20 b) Valvae planae vel leviter tantum concavae, eae floris primarii si flores
 secundarii evoluti, inaequales, flores secundarios et tertiarios non occultan-
 tes *R. simpliciflorus*
- 21 a) Valvae 6—7×7—8 mm, nervo mediano in valvis omnibus longitudinaliter
 fusiformi-incrassato *R. bipinnatus*
- 21 b) Valvae 7.5—9(—10)×(5—)6(—7.5) mm, omnes callum crassum ovoideum
 antice rotundatum partem centram valvae occupantem ferentes. *R. pictus*

Sect. A. Hastati.

LÖVE in Bot. Notis. 1944: 239 (1944).

Frutices vel suffrutices. Flores gynodioici vel polygamo-dioici (hermaphroditi?). Valvae fructiferae orbiculatae cordatae vel reniformes interdum longitudine latiores apice emarginatae.

3. *Rumex Lunaria* L.

L., Spec. plant. ed. I.: 336 (1753); CAMPD., Monogr. Rum. 70, 136 (1819); MEISN. ap. DC., Prodr. 14: 73 (1856).

Syn.: *R. polygamus* CAV., Icon. et Descr. pl. Hisp. 1: 14, tab. 22 (1791).

Lapathum arborescens MOENCH, Method. 355 (1794).

Acetosa Lunaria MILL., Gard. Dict. 68 (1768).

Frutex elatus ramis flexuosis purpurascentibus vel brunneis breviter articulatis internodiis 2—4 cm longis, vetustioribus ad nodos incrassatis sulcato-striatis, inflorescentiis terminalibus. *Ochreae* hyalinae breves patulae, sat longe persistentes. *Folia omnia* longe (2—4 cm) petiolata, consistentia in vivo ut videtur carnosa, in sicco crasse rigide membranacea, plana integerrima, glauca; nervi tenues laxè pennati indistincte anastomosantes, par infimum elongatum costae medianae interdum parallelum valde ramosum. Lamina 2.5—5 cm longa, 2.5—6 cm lata.

longitudine saepe latior, ambitu perlate ovato-spatulata, prope basin latissima transverse truncata et breviter sinuato-cuneata, apice late rotundata rarius late rotundato-attenuata interdum indistincte apiculata; folia superiora vix decrescentia. *Inflorescentia* iteratim paniculato-ramosa, ampla sed dense conferta, aphylla. *Florum glomeruli* plerumque 6—8-flori. *Pedicelli* fructiferi valvas subaequantes, filiformes, in tertia circ. parte inferiore tenuiter articulati, basin perigonii versus insensibiliter dilatati. *Perigonii foliola exteriora* reflexa, lanceolata, ca. 2 mm longa. *Valvae* fructiferae e basi profunde anguste cordata late reniformi-orbiculatae, antice late rotundatae vel truncatae, ad emarginationem callo minuto applanato rectangulari praeditae margine integrae vel obsolete subcrenatae, tenuiter membranaceae, nervatura subaequali reticulata leviter distincte prominente maculis subsodiametricis. *Nux* matura ca. 3 mm longa, ca. 1.3 mm lata, paulo infra medium latissima.

Canary Islands.

Gran Canaria: Las Palmas (OSTENFELD s.n., C.); Alta Tafira, 350 m (FLEISCHER 390, U.); Arucas Tafira (O. GELERT s.n., C.); Oberhalb Telde (FLEISCHER 391, U.); Sta. Brigida, 450 m, (BÖRGESEN 704, C.; KOOPMANS 82, U.);

Teneriffa: La Paz (TULLGREN 157, S.); Orotava (BÖRGESEN 42, 63, C.); In rupestribus Taganana (BOURGEAU 1526, C.); ohne Fundort (QUARLES VAN UFFARD 109, U.).

Cultivated and escaped from cultivation.

Sicily: Mandanici (C. AINTI s.n., FI.); Scipi presso il mare a Portoempedocle (ohne Sammler, FI.).

Sardinia: Isola S. Pietro ad sepes in collibus arenosis Spalmadore (MARTELLI s.n., FI.).

LÖVE, Botan. Notiser 1944: 239 (1944) has adopted *R. Lunaria* as the type species of his Sect. *Hastati*, the name of which has apparently nothing to do with *R. Lunaria* but seems to indicate rather *R. hastatus* DON. *R. Lunaria* is cultivated in southern Italy, Sicily and Sardinia and seems to be well established in several localities.

4. *Rumex nervosus* VAHL.

VAHL in Symb. bot. 1: 27 (1790); CAMPD., Monogr. Rum. 67 et 110 (1819); MEISN. ap. DC., Prodr. 14: 72 (1856); RECH. F., Candollea 12: 21 (1949). *R. alismaefolius* FRESEN, Flora 21: 602 (1838); MEISN. ap. DC. Prodr. 14: 72 (1856).

Frutex longe irregulariter virgato- et partim divaricato-ramosus. *Rami* teretes, tenuiter sulcato-striati, cortice brunneo-cinerascenti, internodiis

ramorum vetustorum 3—5 cm longis, iis ramorum sterilium axillarium valde abbreviatis. *Inflorescentiae* parvae apertae ramis irregulariter arcuato-flexuosis. *Ochreae* pallidae, membranaceae, valde caducae. *Folia omnia* elliptica usque anguste lanceolata, basi cuneato-attenuata, lobis basalibus nullis, glaucescentia, consistentia in sicco crasse coriacea, nervis tribus parallelis percursa, maiora ad 4 cm longa, 0.7—1.5 cm lata, petiolo dimidia laminae latitudine suffulta, acuta, in medio circiter latissima. Folia ramorum sterilium proportionem angustiora. *Florum glomeruli* pauciflori. *Pedicelli* fructiferi filiformes, prope basin tenuiter articulati, quam valvae breviores. *Perigonii foliola exteriora* libera, elliptico-lanceolata, acuta, reflexa, ± 1.5 mm longa. *Valvae* fructiferae e basi late et profunde emarginatae ± 4 mm longae, 4.5—6 mm latae, antice rotundatae, tenuissime membranaceae, subpellucidae subnitentes, perpallide brunneae, integrae, tenuiter regulariter reticulato-nervosae, maculis nervaturae omnibus isodiametricis, ima basi callo minuto reflexo applanato praeditae. *Nux* matura pallide brunnea, ad 2.5 mm longa, ad 1.3 mm lata, paulo infra medium latissima.

Distr. geogr.: Arabia australis, Africa orientalis.

Ethiopia.

Eritrea: Adi Nefas (PAPPI s.n., FI). Assaorta. Mts. Urug, 2547 m (PAPPI 3484, FI). Ad-Taclesan—Keren (TELLINI 1157, FI). Bet Gherghis (DE BENEDICTIS 116, FI). Bogos, inter Aliu Mandel et Alibaret, 2000 m (TERRACCIANO & PAPPI 2531, FI). Hamasen: Ad-Douegher, 2300 m (PAPPI 182, 194, FI); Asmara (BUSCALIONI 8, CHIOVENDA 154, TERRACCIANO & PAPPI 232, FI); 2300 m (FIORI 491, FI); presso Asmara (PICHI-SERMOLLI 1546, FI); Altipiano Asmara (TELLINI 382, FI); Asmara-Belesa, 2400 m (TERRACCIANO & PAPPI 2557, FI); Asmara, Ad-Taclesan (TERRACCIANO & PAPPI s.n., FI), ibidem, 2200 m (TERRACCIANO & PAPPI 422, FI); Belesa, 2200 m (TERRACCIANO & PAPPI 304, FI); Betgherghis (BALDRATI 4704, FI; DE BENEDICTIS 66, FI), in 2000 m (BALDRATI 69, 4711, FI), ibidem, prope Hebot (BALDRATI 4700); Forte Bet-Maka (. . . 1, FI); Valle Mai-Hinzi, 1400—2000 m (TERRACCIANO & PAPPI 220, FI); Medrizien, 2320 m (FIORI 492, FI); Nefasit (BUSCALIONI 215, FI); Nefasit al Mahabar, 1600 m, (FIORI 493, FI); Ad-Rassi (PAPPI 4941, FI); Scicchett 2040 m (FIORI 49, FI); presso la Stazione di Zazega (BUSCALIONI 235 FI); Da Belesa a Dega Tros e Caramy (PAPPI 3606, FI); Dintorni di Asmara (PAPPI 4401, FI); Inter Ghinda et Asmara (TERRACCIANO & PAPPI 108, FI); Mai-Hinzi (PAPPI 3357, FI); Quazien, a occidente del Dorfu, 2000 m (RAGAZZI 275, FI); Sala-Dharò, 2300 m (PAPPI 2312, FI). Habab: Altopiano di Nacfa versus Mao (TERRACCIANO & PAPPI 989, FI). Mensa: Abbacuset, 1900 m (TERRACCIANO & PAPPI 103, FI); Valle Cattalaben, 1900 m (TERRACCIANO & PAPPI 1553, FI); Mte. Ira versus Nuret, 2000 m (TERRACCIANO & PAPPI 888, FI); Aba Maitan-Dada, 1400—1600 m (TERRACCIANO & PAPPI 2185, FI). Ocule-Cusai: Addi-

Caieh, 2230 m (MILCHERSICH 24, FI); Saganeiti, 2200 m (SCHWEINFURTH & RIVA 789, FI, K); Saganeiti, pente du Nord en dessous d'Addi-Abboun, 2100—2300 m (SCHWEINFURTH & RIVA 1814, FI, K); Saganeiti-Acrur, 1900 m (PAPPI 3818, FI); Selet-Saganeiti, 1800 m (PAPPI 3757, FI); Gura, 2200 m (PAPPI 4264, FI); Torrente Baratanti, 2400 (PAPPI 4353, FI). Saraè: lungo il torrente di Enda-Abba-Mata presso Chiesa Daara, 2000 m (PAPPI 16, FI); nei pressi di Mai-Armoz, 2000 m (PAPPI 45, FI); lungo il Mai-Masan, 2000 m (PAPPI 124, FI); lungo il Mai-Maasa presso Dander, 2000 m (PAPPI 182, 188, FI); nei prati presso Addi-Naha, 2000 m (PAPPI 18, FI); Adi Ugri, nella collina del forte (BELLINI 421, FI). Tembien (SOLLAZZO 375, 376, 377, FI). Valle Gaaba (ROVERSI 55, FI). Uogerat: Passo Aia, 2900 m (VATOVA 2480, FI); Piana di Enda Corcos, 2400 m (VATOVA 2507, FI). Eritrea (BALDRATI 3029, FI).

A m h a r a: Alto-Semien: Ciglione del versante destro della valle di Beleghes, Reg. San-Caber, 3300 m (PICHI-SERMOLLI 2711, FI). Bacino del Lago Tana: Amba Libò 2850—2950 m (PICHI-SERMOLLI 1548, FI); Isola Daga (PICHI-SERMOLLI 1560, FI); presso il villaggio di Debra-Tabor (PICHI-SERMOLLI 1530, FI); lungo la strada per Ifag a 4 km da Debra-Tabor (PICHI-SERMOLLI 1551, FI); pendici diboscate sotto la chiesa di Techlè Aimanot, Penisola di Zeghiè (PICHI-SERMOLLI 1555, FI); pendici diboscate sotto la chiesa di Techlè-Aimanot, Penisola di Zeghiè (PICHI-SERMOLLI 1557, FI); Collina dove è la chiesa di Medania-Alem (Debra-Tabor) (PICHI-SERMOLLI 1549, FI); Fascia diboscata nella parte merid. della Penisola di Zeghiè presso il mercato (PICHI-SERMOLLI 1556, FI); Monte Vuoghelsà (Zeghiè) (PICHI-SERMOLLI 1559, FI); Pianura ad ovest di Quonzelà (PICHI-SERMOLLI 1558, FI); presso la chiesa di Sciaura-Mariam, Alefà (PICHI-SERMOLLI 1553, FI); Mte. Quatelè presso il villaggio di Tata (PICHI-SERMOLLI 1552, FI); Penis. Zeghiè (Südufer des Tana) (D.R. 142, FI); Debra-Uddus-Gabriel (PICHI-SERMOLLI 1554, FI). Gondar (CHIOVENDA 1384, FI; MASSEY 27, PLOWDEN s.n., K).

G a l l a S i d a m o: Barodda, prope Sodu (VATOVA 1229, FI). Cencia, Lago Regina Margherita (VATOVA 1898, FI). Conca di Dorze (VATOVA 1753, FI). Sidamo, Ciecù (MARCHETTI 100, FI).

S c i o a: Accampamento a nord di Addis Abeba (TASCHDJIAN 56, FI); Strada da Addis Abeba ad Oletta (GIORDANO 540, FI); Viaggio Addis Abeba—Nilo Azzuro (BUSCALIONI 1208, FI); Gubba Gatteri presso Addis Abeba, 2900 m (NEGRI 404, FI); Addis Abeba (ARMBRUSTER s.n., K). Biscioftù, valle intorno al lago omonimo (BENEDETTO 78, FI). Entotto, presso la cascata del grande Cabana (NEGRI 321, FI). Per il Passo Urgan, sulla pianura di Gindebarath pr. Haro (TASCHDJIAN 137, FI).

H a r a r: Harar (ROBECCHI & BRICCHETTI 189, FI); Harar, 2150 m, 9° 18' n., 42° 6' o. (GILLETT 5027, K). Lake Haramaya (DRAKE-BROCKMAN 17, K).

Abyssinia (QUARTIN-DILLON & PETIT 77, K) (SCHIMPER 152, 1484, K, NY).

I have not seen the type specimen of *R. nervosus* VAHL («in montibus Hadiensibus Arabiae ubi Ohrob vocatur, leg. FORSKAHL fide MEISN.») or of *R. alismaefolius* FRESN. («Abyssinia leg. RUEPPELL»). FRESNIUS himself states that there is a close affinity between his species and *R. nervosus*, and I can find no hint in his short description of any dif-

ference. The closest relative of *R. nervosus* is *R. Ellenbeckii* DAMMER, which differs only by its extremely narrow leaves and perhaps does not deserve specific distinction, as there are some intermediates as for instance CHIOVENDA 154, BOSCALIONI 935, SCHIMPER 152, 1484. Another close relative is *R. trinervius* RECH. F. (see pag. 15).

R. Limoniastrum JAUB. et SP. (S.E. Arabia) with similar leaves is much more different, having its valves broader than long and emarginate at the top and broader outer perianth segments connate at base.

I have seen neither the type specimen nor the original description of *R. nervosus* var. *usambarensis* ENGLER in Glied. Veg. Usambara 61 (1894). In Pflanzenwelt Ostafrikas 169 (1895) ENGLER refers to this variety with the following words: »Schlingstrauch mit bis armdicken Stamm, auffallend durch seine grossen, leuchtend roten Fruchtstände; in Gebüsch, namentlich der Adlerfarn-Formation und im Hochwald». In Englers Bot. Jahrb. 38: 61 (1905) DAMMER has raised ENGLER's variety to specific rank, without description, only saying: »sie ist sehr verbreitet durch Ostafrika und kommt zuweilen zusammen mit *R. nervosus* VAHL vor. Diese ist in Ostafrika seltener als *R. usambarensis*, welche sich zu einem sehr schönen Strauch entwickelt, dessen Zweige nach VOLKENS bisweilen armdick werden». A. PETER, Fl. Deutsch-Ostafrika in Fedde Rep. Beih. 40, 2: 197 (1932) gives the following characterization in his key of *Rumex*: »Blätter nicht spiess- oder pfeilförmig. Rispen klein, locker oder dicht gestellt. Monoözisch. Halbstrauch *R. nervosus* Vahl» and under this the following entry: »var. *usambarensis* ENGL. Stengel bis 12 m lang, schlingend». The first sentence (Blätter nicht spiess- oder pfeilförmig) gives the contrast to *R. maderensis* »LOWE» (= *R. trinervius* RECH. F.).

5. *Rumex Ellenbeckii* DAMMER.

DAMMER in Englers Bot. Jahrb. 38: 61 (1905).

Frutex iteratim flexuoso- et partim divaricato-ramosus, habitu *Caligonii*. *Rami* teretes, cortice brunnea, tenuiter sulcato-striati, vetustiores internodiis 3—6 cm longis, inflorescentias irregulariter laxiuscule paniculatas ex axillis proferentes. *Ochreae* valde caducae. *Folia omnia* anguste lineari-lanceolata, longe petiolata, in vivo ut videtur carnosula, in sicco sat crasse membranacea, forma valde variabili; ad summa 4.5 cm longa, 8 mm lata, sed plerumque multo angustiora; petiolus laminam saepe aequans, lamina basi obsolete usque valde distincte auriculato-hastata, rarius auriculis omnino destituta basi subito vel

sensim attenuata, apicem acutam versus sensim angustata, costa mediana non prominente, nervis ceteris saepe obsoletis. *Inflorescentia* iteratim divaricate flexuose arcuato-ramosa, aperta, laxiuscula, interdum in parte inferiore foliata. *Florum glomeruli* pauciflori. *Pedicelli* fructiferi tenuissime filiformes, infra medium insensibiliter articulati, deflexi, valvas aequantes vel paulo longiores. *Perigonii foliola exteriora* 1—1.5 mm longa, libera, lanceolata reflexa. *Valvae* fructiferae late rotundato-cordatae, 3(—4) mm longae, ad 6 mm latae, basi anguste sinuato-emarginatae callum minutum applanatum reflexum ferentes, margine subintegrae vel valde obsolete erosulo-denticulatae, consistentia tenuissime membranaceae subpellucidae, colore pallide brunneae, nervatura tenuiter prominente subregulariter reticulata, maculis nervaturae marginalibus vix elongatis. *Nux* matura 1.8—2 mm longa, ± 1.1 mm lata, fusco-brunnea, vix infra medium latissima.

Ethiopia.

Eritrea: Asmara (A. TERRACCIANO & PAPPI s.n., R).

Galla Sidamo: Galla Arussi: Luoghi aridi argillosi soleggiati presso il burrone del Fiume Suksuki, 1550 m (inter lac. Zuai et lac. Abeida). (NEGRI 898 et 898^{bis}, FI). Lago Auasa, praterie lungo la sponda. 29.III.1938, blühend. (VATOVA 2176, FI). Galla Sidamo, cespuglio sulla rocca trachitica di Adami Tullo, ster. (SENNI 675, FI). Galla Sidamo, Lago Sciala. (VATOVA 2237, FI).

The basal leaf-lobes are sometimes very well developed (NEGRI 898^{bis}, VATOVA 2237, etc.), but often nearly or completely lacking.

I have not seen the type specimen of this species (»Gallahochland: Arussi-Galla, auf der Felseninsel Tuluguto im See Suai, blühend im November, leg. ELLENBECK 1886, Herb. B.«), which probably does not exist any more. There can be no doubt about the close relationship between this species and *R. nervosus*. *R. Ellenbeckii* is easily recognized by its extremely narrow leaves, but there is no close correlation between this character and others. I cannot find an absolute limit between it and narrow-leaved forms of *R. nervosus*, such as NEGRI 898 (cited under *R. Ellenbeckii*), and JABOLI 55 and SCHIMPER 152 and 1484 (cited under *R. nervosus*), all of which might be regarded as intermediates. But I prefer to maintain *R. Ellenbeckii* as a species, as such intermediates seem to be rare.

6. *Rumex trinervius* RECH. FIL.

RECH. FIL. in Oesterr. Botan. Zeitschr. 99: 523 (1952).

Synon.: *R. maderensis* BAKER and WIGHT, Fl. Trop. Afr. 6, 1: 115 (1909);

A. PETER, Fedde Rep. Beih. 40, 2: 198 (1932). Non LOWE, Nov. Fl. Mad. 12 (1838).

Frutex flexuoso-ramosus 2—3 m et ultra altus interdum scandens, ramis hornotinis herbaceis teretibus laevibus tenuissime striatis, internodiis 4 cm longis, e nodis ramos florendi et fructificationis tempore abbreviatos plurifoliatos emittens. *Inflorescentia* terminalis aphylla aperta tenuiter iteratim divaricate ramosa. *Ochreae* brunneae membranaceae. *Folia* omnia petiolata; petiolus tenuis, plerumque circiter dimidium laminae latitudinis aequans; lamina 3—5 cm longa, (1)—2—3 cm lata, consistentia in vivo verosimiliter carnosio-herbacea, in sicco crasse membranacea usque subcoriacea, imprimis subtus glaucescens, glabra, laevis, costa mediana tenuis, nervo laterali utrinque ex ima basi laminae abeunte costae medianae subparallelo cum ea laxe tenuiter reticulato-anastomosante, ambitu elliptico- vel oblongo- vel lanceolato-hastata, lobis basalibus angustis brevibus acutis plerumque deflexo-divergentibus, in medio vel paulo infra latissima, apicem versus angustata, apice ipsa interdum submucronulato-acuminata. *Pedicelli* ca. 3—5-ni ex axillis ochraearum minutarum brunnearum membranacearum orti, tenuiter filiformes, infra medium tenuiter saepe inconspicue articulati, valvas ad summum aequantes sed saepius breviores. *Perigonii foliola exteriora* 2 mm longa, latiuscule lanceolata, tenuiter membranacea, brunnea, libera in emarginatione valvarum reflexa. *Valvae* ex emarginatione (4—)5 mm longae, 5—7 mm latae, basi anguste profunde emarginatae, antice rotundatae, margine integrae, consistentia tenuiter membranacea, subpellucidae, pallide carneo-brunneae saepe purpureo-suffusae, tenuiter subaequaliter reticulato-nervosae, maculis nervaturae \pm isodiametricis; *callus* minutissimus compressus in emarginatione valvae reflexus semper evolutus. *Nux* 2—2.5 mm longa, brunnea, nitida, paulo infra medium latissima.

Tanganyika.

Mininga, Unyamwezi (SPEKE & GRANT 77, K). Mbisi Mts. over 7000'; herb to straggling climber up to 10 ft. on shrubs, leaves with astringent taste (MICHELMORE 711, K, Typus). Mbulu Plateau, 6000'; straggling bushy plants to 6 ft. high (BURTT 4266, K). S.W. Pares near Vudee 4500', a much branched shrub (GREENWAY 2058, K). Mbeya, 5500', (DAVIES 428, K). E-Usambara, Amani, 2900', possibly cultivated; a weak-stemmed shrub with stems up to 12 ft. long, supported by other vegetation (GREENWAY 1771, K). Makuyuni Distr. (KORITSCHONER 972, K). Mbulu (STAPLES 278, K). Ukambani, Kibwesi, 1000 m, Buschsteppe, Lavafelsen, in humusgefüllten Spalten (SCHEFFLER, 143, K). Kilimanjaro, 4500—6000', Marangu, 5000'; a shrubby herb up to 6 ft.

tall, common and often dominant in secondary *Myrica kilimandscharica*—*Agaurea* bush in areas of native cultivation (GREENWAY 3890, K), Kilimanjaro, 6000' (JOHNSTON, s.n., K). Kilimanjaro (SMITH, s.n., K). Viktoria See, felsige Buschsteppe (CONRADS 201, K). Near Mbulu (EVANS & ERENS 886, PRE). Moshi Distr., Lyamungu, 4300 ft. (WALLACE 1073, K). Northern Province, Djalla Krater (GEILINGER 4152, K). Kilimanjaro, oberhalb Marangu, 1700 m (GEILINGER 4109, K). Stromgebiet des oberen Ruhudje, Landschaft Lupembe, nördlich des Flusses (H. I. SCHLIEBEN 1137 A, S, Br.). Lupembe, oberhalb Ruhudje, nördlich des Flusses kletternd (SCHLIEBEN 1137, K, S).

Kenya.

Mt. Kenia, Pr. Marania River, in fruticetis (R. E. & C. E. Fries 1530, LD, UPS, K). Machakos (HARGER 394, K). Kima, 5000' (NAPIER 32, K). Nakur, 6500' (SNOWDEN 549, K). Elmenteita. Rocky hills around Lake Elmenteita, 5500—6000 ft. (BOGDAN 988, K). Common weed on better soil in grassland round Machakos, 6000 ft., (GARDNER 1400, PRE). Rongai Forest Station, 7500 ft., (E. BATTISCOMBE 1182, K).

Uganda.

Toro, Mwenge, 5000' (SNOWDEN 51, K). Kisoro, Kigezi, 6000'; volcanic plain, shrub up to 10 ft. (PURSEGLOVE 746, K). Entebbe, 3863' (MAITLAND 4, K). Serere, Teso, 3600' (CHANDLER 698, K). Entebbe (MAITLAND s.n., K).

Belg. Congo.

Lac Kivu, Baie de Sake (ROBYNS 2490, K). Kivu (LOUIS 5124, K). Virunga Mts., N. Lake Kivu, Kateruzi Volcano, common spectacular shrubby herb on ash slopes of volcano, shrub to 4 ft. high (BURTT 3284, K). U'gano U'gano, 10 miles NE. of Nyozzo (SHANTZ, 713, K). Parc National Albert, Kibati (DE WITTE 1280, K). Between Goma and Sake (EVANS & ERENS 1800, PRE). Ninagongo prope lacum Kivu, 2000 m (R. E. FRIES 1597, UPS). Isari—Ruanda (ROBYNS 2427, P.), Entre Naymbasra et le Mikeno (LOUIS 4832, P.), Saki (GHESQUIERE 4309, P.).

North Rhodesia.

Fwambo east of Abercorn, North Rhodesia (CARSON s.n., K).

Nyasaland.

Panda Peak, 6380 ft., (MCCLOUNIE 150, K).

Up to the present, this species has been confused with *R. maderensis* LOWE, endemic to Madeira and the Canary Islands, on account of a certain similarity in habit and size of valves. *R. trinervius* differs specifically from *R. maderensis*, however, by its longer pedicels, isodiametric reticulation of valves always bearing a small reflexed compressed angular callosity, thick leaves usually narrowed above the basal lobes and

having three parallel nerves. I was not able to trace an older name for this species.

R. trinervius varies especially in size and shape of leaves, these being broadly ovate-scutate in MICHELMORE 711, oblong-hastate in GREENWAY 3890. The pair of lateral nerves is more salient in the broad-leaved forms but always visible on closer observation also in the narrow-leaved forms.

The nearest relative of *R. trinervius* is not *R. maderensis*, but *R. nervosus* VAHL. Both species agree very well in outline and size of valves and in the presence of a compressed reflexed basal callosity. They differ, however, in habit, which is more slender and sometimes scandent in *R. trinervius*, and in leaf-shape. Whereas homologous variations from narrowly lanceolate to broadly elliptic leaves can be observed, basal lobes are present in *R. trinervius* and never in *R. nervosus*.

The two species replace each other, *R. trinervius* inhabiting tropical East Africa, *R. nervosus* Aethiopia and Arabia.

7. *Rumex Aristidis* Coss.

Coss. in Bull. Soc. Bot. France 5: 103 (1858).

Frutex multicaulis 20—50 cm altus. *Rami* virgati leviter arcuati vel subrecti breviarticulati ad nodos incrassati dense foliosi subteretes atrati, tenuiter sulcato-striati, simplices vel prope basin ramosi, in tertia vel quarta parte superiore in paniculam iteratim ramosam densam abeuntes. *Ochreae* tenuiter membranaceae cauli appressae subpellucidae albido-brunnescentes, mox lacerato-dissolutae. *Folia omnia* anguste linearia 4—6 cm longa, 1.5—2 cm lata, in parte superiore latissima, basin versus sensim longe attenuata, apice acuta, in vivo ut videtur subcarnosa, in sicco crassiuscule membranacea, nervis parallelis tenuibus percursa. *Paniculae* aphyllae rami iteratim divaricate flexuoso-ramosi breviarticulati. *Florum glomeruli* pauciflori; flores dioici. *Pedicelli* fructiferi tenuissime filiformes valvas longitudine aequantes, infra medium insensibiliter articulati. *Perigonii foliola exteriora* libera, lanceolata, reflexa, 0.6 mm. longa. *Valvae* fructiferae late rotundato-cordatae, ± 4 mm longae, ± 5 mm latae, basi late sinuato-emarginatae, margine minute irregulariter eroso-crenulatae usque subintegrae, consistentia tenuissime membranaceae subpellucidae, colore pallide bruneae saepe purpureo-suffusae, omnino ecallosae, nervatura tenuissime prominente prope centrum valvae isodiametricae reticulata, marginem versus sat conferta subradiata. *Nux* matura ± 2 mm longa, ± 1.1 mm lata, vix infra medium latissima, fuscobrunnea.

Algeria.

Senhadja, 30.VI.1860 (LETOURNEUX s.n., S, C); Senhadja, in cumulis arenorum, VII.1889 (LETOURNEUX s.n., S). In aggeribus arenosis ditionis Senhadja inter Bône et Philippeville (LETOURNEUX et PERRAUDIÈRE ap. KRALIK, Plantae Algerienses selectae No. 140, S, UPS, K, C). Sables des Senhadja, entre Philippeville et Bône (LETOURNEUX et PERRAUDIÈRE, Fragmenta Florae Algeriensis Exsiccata No. 593, S, LD). Philippeville (LETOURNEUX s.n., UPS). Kroumirie orientale dunes à mi-distance entre le poste forestier d'Ain Ouled Seboa et Cabarque (COSSON, BARRATTE et DUVAL s.n., K). »Algeria» (Ex Herb. A. GRAY, NY). Hort. bot. Köbenhavn cult. e sem. lectis in Algeria (COSSON s.n., C).

This species is very distinct from all the other fruticose species by having short articulated stems. It has the narrowest leaves of all the North African species and can be compared in this respect only with the East African *R. Ellenbeckii* DAMM. which is very near to *R. nervosus* VAHL and quite distinct from *R. Aristidis* by the characters of flowers and fruits.

8. *Rumex maderensis* LOWE.

LOWE in Nov. Flor. Mad. 12 (1838), nec aliorum.

Suffrutex? vel herba elata, certa ultra 60 cm alta. *Caulis* strictus vel paulo angulato-flexuosus, teres, tenuiter sulcato-striatus, saepe atropurpureus, ex axillis foliorum ramos steriles abbreviatos proferens, in tertia vel quarta parte superiore in paniculam aphyllam iterum iterumque patule tenuiter flexuoso-ramosam abiens. *Ochreae* brunneae membranaceae evanescentes. *Folia inferiora* petiolo 4—8 cm longo suffulta; lamina ambitu triangulari-scutata vel -hastata, basi plerumque late cordata rarius sinuato-subtruncata, lobis basalibus acutis non vel vix productis lateraliter patentibus vel deorsum flexis, lateribus paulum convexis vel subrectis, apice acutis, consistentia in sicco sat tenuiter rarius crassiuscule membranacea, color laete viridis rarius glaucescens subtus paulo pallidior, nervatura subtus flavescens tenuiter prominens regulariter subpalmato-pennata, nervorum paria 2—3 basalia e basi ipsa orta copiosius ramosa nervulis partim in lobos basales partim sursum directis. *Folia superiora* similia, sensim minora, brevius petiolata. *Glomeruli* pauciflori. *Pedicelli* tenuiter filiformes, saepissime in tertia circiter parte inferiora tenuiter articulati, quam valvae plerumque breviores. *Perigonii foliola exteriora* libera, lanceolata, reflexa, 1.5 mm longa. *Valvae* fructiferae e basi anguste profunde emarginata orbiculata, ex emarginatione 4—6 mm longa, usque 7 mm lata, tenuiter membrana-

cea, in sicco pallide brunnea vel carnea saepe purpureo-suffusa, antice rotundata, margine minute eroso-sinuato-denticulata, nervo mediano prope basin interdum paulo incrassato sed non callifero, maculis nervaturae medianis isodiametricis, marginalibus valde radialiter productis. *Nux* fusca ad 2 mm longa, ad 1.1 mm lata, paulo infra medium latissima.

Madeira.

Madeira (LEMANN s.n., K); Banks by roadside (GILLIVRAY 79, K); Buena Vista, Santa Cruz, 700 m (LOWE 129, K Typus); In muris vetustis Jardin da Serra, 700—1000 m (MANDON 212, K, NY); Ribeira da Madadi (LOURBARBRAT(?) s.n., UPS. »var. *glauca* Lowe«).

Canary Islands.

Teneriffa: Teneriffa (ex Hb. WEBB s.n., K); Barranco di San Antonio (H. & E. DAHLSTEDT s.n., UPS); In rupibus humidis regionis mediae, Guimar (BOURGEAU 1527, K, UPS); Villa de Orotava (MANN 2365, K).

Palm a: Barranco del Rio (SPRAGUE & HUTCHINSON 1213, K); Cliffs above Tenerra, Caldera (SPRAGUE & HUTCHINSON 463, K); Between Cumbre Vieja and Santa Cruz, 500 m, on walls (SPRAGUE & HUTCHINSON 503, K).

Hierro: Hierro, in convallibus (BOURGEAU 89, K).

»Canaren« (BOURGEAU s.n., K; FENDLER s.n., K; VOGEL s.n., K).

The East African plant, *R. trinervius* RECH. F. (see pag. 15), which has been confused by all authors with *R. maderensis*, is indeed similar to that in habit, but can easily be distinguished by the thick leaves narrowed at base and always with 3 parallel nerves, by the longer pedicels and the isodiametric nervation of valves, which always bear a small reflexed compressed angular grain. SPRAGUE and HUTCHINSON 1213 has thickish very glaucous leaves.

Sect. B. Scutati.

LÖVE in Bot. Notis. 1944: 239 (1944).

Perennis, basi lignescens surculos repentis emittens. Flores hermaphroditi. Perigonii foliola exteriora marginibus basalibus valvarum appressa. Valvae fructiferae rotundato-cordatae membranaceae apice non emarginatae, ecallosae.

9. *Rumex scutatus* L.

L. in Sp. Pl. ed. 1: 337 (1753); CAMPD. Mon. Rum.: 70 et 132 (1819); MEISN. ap. DC. Prodr. 14: 69 (1856); RECH. F., Candollea 12: 23 (1949).

Syn.: *R. hastaeifolius* M.B., Fl. taur.-cauc. 1: 290 (1808).

R. pubescens C. KOCH in Linnaea 22: 211 (1849).

Rhizoma lignescens caules basi lignescentes ascendentes et surculos subterraneos emittens. Caules saepe a basi ramosi. *Folia* forma variabilia, latitudine \pm aequilonga, hastata vel hastato-panduriformia, supra lobos basales \pm contracta lobo mediano plerumque lato antice late acuminato vel subrotundato, lobis basalibus \pm angustis acutis. *Folia* omnia petiolata, glauca vel viridia. *Inflorescentia* laxissima e ramis paucis erecto-patentibus remote floriferis composita vel paniculata. Flores hermaphroditi vel polygami. *Pedicelli* filiformes quam valvae plerumque breviores, infra medium articulati. *Perigonii foliola exteriora* florum femineorum fructificationis tempore marginibus basalibus valvarum appressa herbacea vix 2 mm longa elliptica subcymbiformia libera obtusiuscula. *Valvae* fructiferae pallescentes subpellucidae, 4.5—6 mm longae, ad 5 mm latae, basi anguste profunde cordatae, late ellipticae, antice rotundatae, facie tenuissime reticulato-nervosae margine integerrimae, omnino ecallosae. *Nux* griseo-flavescens, 3—3.5 mm longa, infra medium latissima.

Icon.: BECK in Reichb. Icon. 24, tab. 195 (1909).

Distr.geogr.: Montes Asiae austro-occidentalis et Europae mediae et australis. Probabiliter etiam in Africa boreali.

10. *Rumex induratus* BOISS. et REUT.

BOISS. et REUT., Pugillus plant. nov. 107 (1852).

Rhizoma caudices plures ramosos tenuiter lignescentes \pm elongatos emittens. *Caules* plures usque numerosi, 25—50 cm longi, tenues tenaces glauco-pruinosi glabri leaves, tenuiter sed distincte sulcato-striati, a basi iteratim divaricate ramosi, a medio circiter floriferi, ramis floriferis tenuibus elongatis saepe \pm intricatis post florendum persistentibus. *Folia* in vivo omnia subcarnosa glaucescentia, omnia longiuscule petiolata, petiolo laminam in inferioribus saepe superante in superioribus sensim brevior; lamina sat parva, 1(—2) cm longa, (2—)5(—10) mm lata, scutiformis, latitudine variabilis, lobis basalibus saepius latiusculis deflexis usque divergentibus acutis vel acuminatis; lamina apice \pm late rotundato-acuminata rarius acuta; folia media iam valde diminuta, planta superne aphylla. *Ochreae* membranaceae evanescentes. *Pedicelli* in axillis ochrearum minutarum plerumque 2—3-ni, recurvi, filiformes, purpurascens, in tertia parte inferiore tenuiter sed distincte articulati. *Perigonii foliola exteriora* in statu fructifero \pm 1.5 mm longa, latiuscule lanceolata, herbacea, membranaceo-marginata, libera, in emarginatione valvarum reflexa. *Valvae* fructiferae ex emarginatione

basali angusta profunda ad 7 mm longae, ad 9 mm latae, suborbiculares, integrae, antice truncatae vel perlate rotundatae, tenuissime membranaceae, subpellucidae, primum virentes, deinde albiae rarius rufescentes, tenuissime reticulato-nervosae, omnino ecallosae. *Nux* matura brunescens ± 3.5 mm longa, ± 1.5 mm lata, apice sublongius acuminata.

Distr.geogr.: Hispania, Africa borealis.

Morocco.

Aghadir (GANDOGER s.n., LD); Ait Yousi (GANDOGER s.n., LD); Chirhaouan (GANDOGER s.n., LD); Djebel Ouenta, Ibrahim, Sud Ouest du Maroc (COSSON s.n., LD); Atlas maior: In convalle fluminis Ait Messane, in rupe calcarea prope pagum Aguersioual, ca. 1600 m (H. LINDBERG 3686, LD).

Algeria.

Pentes argilleuses du litoral, centre Oued Damous et Gouraya (A. WARWEY s.n., LD).

I am not yet quite certain about the status of *R. induratus*. It is in any case very near to *R. scutatus* L., differing from the latter by its indurated ramifications, smaller leaves, larger valves with deeper and narrower basal emargination, and outer perianth segments more reflexed in fruit.

From the rather scarce material at hand the characters mentioned are fairly well correlated and do not occur combined outside Spain and North Africa. On the other hand *R. scutatus* is a very widely distributed and rather polymorphic species, varying considerably in size and outline of valves. Final judgement on the status of *R. induratus* depends on a closer examination of the forms of *R. scutatus*. The areas of both species do not strictly exclude each other.

11. *Rumex tingitanus* L.

L. in Syst. ed. X: 991 (1759); SAMUELSSON, Ber. Schweiz. Bot. Ges. 42: 778 (1933).

Syn. *R. sinuatus* NATHORST ex STEUD., Nomencl. ed. 2, 11: 486 (1841).

Perennis, caudicibus tenuibus brunnescentibus saepe surculoso-elongatis, saepe pluricaulis. *Caulis* 30—60 cm altus, tenuis vel validus, strictus vel subflexuosus, ascendens vel erectus, internodiis mediis 2—5 cm longis, a medio plerumque pauciramosus florifer, ramis tenuibus simplicibus aphyllis arcuato- vel erecto-patentibus saepe \pm flaccidis. *Folia omnia* petiolata, basalia verosimiliter non rosulata; petiolus foliorum

inferiorum laminam subaequans usque ea dimidio brevior, in foliis superioribus sensim abbreviatus, in summis quoque semper evolutus. *Ochreae* magnae, hyalinae, persistentes 1—2 cm longae, acute lanceolato-auriculatae. Lamina foliorum ovato- usque oblongo- usque lanceolato-triangularis, basi truncata vel late sinuata rarius attenuata, saepius infra medium latissima, apicem valde acuminatam versus longissime attenuata, \pm profunde irregulariter crispate inciso-lobata usque pinnatipartita (vide var. *laccrum* Boiss.), lobis subintegris vel crispato-crenatis vel sublobatis. *Ochreae* etiam in regione inflorescentiae perlongae acutae persistentes, imprimis ante anthesim valde prominentes. *Pedicelli* in quaque ochrearum axilla 4—7-ni, tenuissime filiformes, in medio circiter articulati. *Perigonii* floriferi 2.5—3(—4) mm longi *foliola exteriora* libera obovata, membranacea, demum (3—)4—5 mm longa, in emarginatione valvarum reflexa. *Valvae* fructiferae 9—11 mm longae, 10—13 mm latae, subaequales, e basi profunde cordato-emarginata late orbiculares, tenuiter membranaceae, pallidae, imprimis marginem versus saepe purpureo-suffusae, margine integrae; nervatura tenuissima reticulato-anastomosans; valvae omnes non calliferae. *Nux* (3—)3.5—4.2 mm longa, 1.5—2 mm lata, rufescens, infra medium latissima.

Distr.geogr.: Africa boreali-occidentalis, Hispania, Gallia australis. — Tabulam geographicam vide SAMUELSSON l.c.

Tangier.

In sabulosis maritimis prope Tanger (SALZMANN s.n., LD, S).

Morocco.

Cap Spartel (GANDOGGER s.n., LD); Daïet Achlef (Moyen Atlas), plateau pierreux calcaire, 1750 m (JAHANDIEZ 447, LD); Djebel Amezdour, 2500 m (E. K. BALLS 2742, S); Mesudscha, in humidis (COURZEILLE s.n., LD); Habitat in arenosis maritimis, juxta Tandja (FONT QUER 163, S).

Algeria.

Sables a Ain-Khelil, sud ouest de la prov. d'Oran (KRALIK 44, W); Hauts-Plateaux, Bedeau, prov. d'Oran (ALLEIZETTE s.n., LD) (A. FAURE 1548, LD); Bou-Saada, sud de la prov. de Constantine (S. REBOUD s.n., W); Pentes sablonneuses du Djebel-el-Tagga pres de Boghard (O. DEBEAUX 379, W, LD); Fort-de-l'Eau, pres Alger, sables au bord de la mer (C. ALLARD 2602^{bis}, NH); Laghouat, in cultis (L. CHEVALLIER 236, LD); La Macta (BOYÉ s.n., W); La Macta, près Mostaganem, sables maritimes (A. FAURE s.n., LD, S; Bolamoz, W; O. DEBEAUX s.n., LD); Env. de Tenira, pelouses sablonneuses, 650 m (A. FAURE s.n., S).

Tunis.

Prope Tunis (ÅBERG s.n., S); Gafsa, in aridis deserti (C. J. PITARD s.n., W); Hammamet, in arenosis (MURBECK 48, LD, S, W); Sousse, in arenosis maritimis (MURBECK s.n., S, LD).

Tripoli.

Ad Sabratta, ad vias deserti (J. BORNMÜLLER 877, S).

Only one variety has been commonly accepted in *R. tingitanus*, var. *lacerus* BOISS. This has been confused with *R. lacerus* BALB. Judging from the material on hand, variation of *R. tingitanus* is much more considerable than this would imply.

The valves are pale whitish or greenish more or less suffused with purple in most specimens, but there are two specimens with bright yellow valves (FAURE 775, S, La Macta pres Mostaganem and COURZEILLE s.n., LD, Morocco: Mesudscha); the second specimen lacks the original label but has one copied by E. M. REINECK, Weimar. These two specimens are so closely similar that I suspect they are parts of the same collection and that the second label does not apply.

Diameter of fruiting valves varies within rather broad limits, both within the stout forms accepted as typical, and in the var. *lacerus* BOISS. but they are larger on the average in the former.

R. tingitanus usually grows on coastal sand dunes, but is not limited to such localities as shown by SAMUELSSON's map of the distribution. Two specimens (BALLS 2724, S, and JAHANDIEZ 447, S, collected in mountain districts far inland at 1750 m and 2500 m, respectively) have about the average stem height but smaller valves, 7—9 mm in diameter. They apparently represent a special ecotype and might deserve systematic recognition.

On account of its dissected leaves, this species has often been confounded with *R. pictus* FORSK. and *R. bipinnatus* L. FIL. It can however be distinguished, even when fruits are lacking, by its perennial growth and solid non-fistulous stem. Unlike the other species, its valves have no callosity.

Sect. C. Euacetosae.

LÖVE in Bot. Notis. 1944: 239 (1944).

Perennes non lignescentes non surculosae. Flores dioici. Perigonii foliola exteriora \pm connata refracta. Valvae fructiferae rotundato-cordatae membranaceae apice non emarginatae, longitudine non latiores.

12. *Rumex intermedius* DC.

DC. in Fl. franc. 6: 369 (1815); MEISN. ap. DC. Prodr. 14: 65 (1865).

Perennis. *Caules* saepe plures, ad 60 cm alti, erecti, internodiis mediis 6—10 cm longis, pallide virides, tenuiter sulcato-striati, a basi fere ramosi, caule primario et ramis in paniculas subapertas sed subdense fructiferas e ramis flexuosis tenuiter pauciramulosis compositas abeuntibus. *Folia basalia* (in specimine unico africano viso deficientia) petiolo longo laminam saepe superante suffulta; lamina e basi hastata linearis, ad 10 cm longa, 1—1,5 cm lata, lobis acutis angustis deorsum flexis, margine saepe crispato-crenata. *Ochreae* membranaceae brunnescentes, in statu fructifero evanescentes. *Folia caulina* superiora e basi anguste sagittata elongato-linearia, margine crispatula, imprimis subtus \pm papillosa. *Pedicelli* fructiferi in axillis ochrearum minutarum numerosi, perigonium fructiferum aequantes, in tertia circ. parte inferiore incrassato-articulati ibique purpurascens ceterum pallidi. *Perigonii foliola exteriora* ad 1.8 mm longa, in statu fructifero complete refracta, ad medium fere in nodulum brunnescenti-aurantiacum concreta, parte libera oblongo-lanceolata membranacea obtusiuscula vel acutiuscula. *Valvae* fructiferae 3—4 mm longae et latae, suborbiculares vel saepius longitudine paulo latiores, basi late leviter emarginatae, callum minutissimum reflexum subquadratum aurantiaco-brunneum basi nodoso-incrassatae foliorum exteriorum appressum ferentes, margine integrae, apice rotundatae, tenuissime membranaceae, pallidae, prope medium virescentes papillis nonnullis obsitae, marginem versus pallidissime brunnescentes laeves, tenuissime reticulato-nervosae, maculis medianis paucis \pm isodiametricis, marginalibus numerosis radiatim elongatis. *Nux* atrofusca, vix 2 mm longa, \pm 1 mm lata, in medio circ. latissima, utrinque breviter subaequaliter attenuata.

Distr.geogr.: Regio mediterr. occid.

Morocco.

Moyen Atlas: Bekrit, bords des champs, 1850 m, 8.7.1927 (JAHANDIEZ 792, LD).

The only African specimen seen lacks the lower leaves. I have therefore completed the description from specimens collected by myself near Montpellier, in the type region. Possibly some references of *R. acetosa* L. from North Africa refer to *R. intermedius*.

13. *Rumex thyrsoides* DESF.

DESF. in Fl. Atlant. 1: 321 (1800); CAMPD. Monogr. Rum. 68, 119 (1819); MEISN. ap. DC., Prodr. 14: 66 (1856), pp.

Perennis. Radicis fibrae vario modo incrassatae, aut napiformes aut fusiformes. *Caulis* singulus vel plures, 30—40(—50) cm altus, validus, profunde sulcato-striatus, internodiis mediis 2—5 cm longis, infra inflorescentiam quartam vel quintam partem superiorem caulis occupantem non ramosus. *Inflorescentia* ab initio dense conferta, ramis arcuato-divergentibus iteratim ramosis. *Folia basalia* (3—)6—12 cm longa, (1—)2—3 cm lata, petiolo laminam usque aequante; lamina ambitu variabilis, basi semper lobis brevibus acutis deflexis aucta, supra medium plerumque latissima, supra lobos basales saepe \pm constricta, latitudine (2—)3(—4)-plo longior, scutato- vel obovato- vel oblongo- vel lanceolato-hastata, plana sed extremo margine erosocrispata, acuta vel acuminata, consistentia in vivo verosimiliter subcarnoso-herbacea, in sicco crasse membranacea usque subcoriacea, glabra vel interdum subtus et ad petiolum papillis albidis obsita, costa mediana crassa, nervis lateralibus pennatis tenuibus valde distincte anastomosantibus. *Folia caulina* numerosa, sensim decrescentia, erectopatentia vel cauli fere appressa, inferiora breviter petiolata, media et superiora basi anguste acute sagittato-lobata, sessilia, quam basalia omnia angustiora acutiora, summa interdum fere linearia, margine anguste crispato-revoluta. *Ochreae* breves membranaceae brunnescentes. *Flores* 3—7-ni in axillis ochrearum minutarum. *Pedicelli* fructiferi tenuiter filiformes recurvi, prope basin tenuiter sed distincte articulati, valvas fructiferas aequantes. *Perigonii foliola exteriora* ab initio majuscula reflexa, fructificationis tempore ad tertiam partem concreta, refracta, pedicellum involucrantia, ad 5 mm longa, ad 2 mm lata, acuta vel obtusiuscula, tenuiter membranacea, tenuissime subparallele nervosa. *Valvae* fructiferae ad 6 mm longae ad 9 mm latae, basi perlate emarginatae vel fere truncatae, apice latissime rotundatae vel obtusae vel rarius indistincte late emarginatae, margine subrenatae usque subintegrae, tenuissime membranaceae subpellucidae, pallide stramineae vel purpureo-suffusae, nervatura tenuissima maculis prope mediam valvam isodiametricis, maculis marginalibus subradiatim longitudinaliter protractis, callus minutissimus ellipsoideus vel angustus ovatus in sinu basilari valvae reflexus. *Nux* \pm 3 mm longa, vix 1.5 mm lata, atropurpurea, nitens, utrinque subaequaliter acuminata.

Distr.geogr.: Reg. mediterr. occid.

Morocco.

Daïet Achlef (Moyen Atlas), plateau calcaire, 1750 m (JAHANDIEZ 585, LD, FI): Atlas medius, prope pagum Azrou, in cultis, ca. 1300 m (H. LIND-

BERG 4118, LD); Grand Atlas: Imi N'Ifri pres Demnat, 1100 m (MURBECK s.n., LD); Djebel Habibi (GANDOGGER s.n., LD); Sefrou, bords des champs, 850 m (JAHANDEZ s.n., LD).

Algeria.

Oran, Sta. Cruz, pelouses et broussailles (A. FAURE 774, LD; ALLEIZETTE s.n., LD).

Tunis.

Tunetia media: In monte Dyr-el-Kef (MURBECK s.n., LD); Maktar (MURBECK s.n., LD); In monte Djebel Serdi (MURBECK s.n., LD); In monte Djebel Bargou (MURBECK s.n., LD).

I have not seen the type of *R. thyrsoides*, but MURBECK, Contr. Fl. N. Ou. Afr. 3: 10 (1899), states, that he has seen it. My description is based first on the specimens in hb. LD revised by MURBECK, and so the interpretation given here is expected to be correct.

There is one flowering specimen in hb. LD collected by MURBECK in Tunetia media, Maktar, differing from the rest by basal and lower stem leaves up to 6 times as long as broad, with dissected basal lobes and very heavily crisped margin. They are marked by MURBECK with a query.

Sect. D. Afroacetosae Rech. fil., ad interim.

Radicis fibrae incrassatae. Caules erecti vel scandentes. Flores monoici vel polygami. Perigonii foliola exteriora libera marginibus interiorum appressa, demum in emarginatione eorum reflexa. Valvae basi callo minuto reflexo praeditae.

Subsect. a. ABYSSINICI Rech. fil., ad interim.

Caules erecti, elati. Flores polygami vel hermaphroditici.

14. *Rumex abyssinicus* JACQ.

JACQ. in Hort. Vindob. 3: 48, tab. 93 (1776); CAMPD., Mon. Rum. 67 et 108 (1819); MEISN. ap. DC., Prodr. 14: 68 (1856); BAKER & WIGHT, Fl. Trop. Afr. 6/1: 114 (1909).

Syn. *R. arifolius* AIT., Hort. Kew, ed. I: 487 (1789); ed. II: 324 (1810—13) excl. syn. fide MEISN., nec al.

R. hastatus A. PETER, Fl. Deutsch Ost-Afr. in Fedde Repert. Beih. 40/2: 196, tab. 25 (1932), nec DON.

Perennis. Radicis fibrae fusiformi- vel napiformi-incrassatae. *Caulis* (50 cm—) 1(—4) m altus, prope basin ad 2—3 cm crassus, erectus teres

subflexuosus fistulosus sed validus, sulcato-striatus, virescensbrunnescens vel purpurascens, *ochreis* brunneis membranaceis, saepius infra inflorescentiam non ramosus; *inflorescentia* 10—40 cm longa, aphylla conferta, ramis iterum iterumque paniculato-ramosissimis. *Folia omnia* in vivo verosimiliter molliter herbacea saturate viridia, in sicco \pm tenuiter membranacea, glabra vel interdum subtus minute papillosa, nervis secundariis tenuibus, infimis a basi laminae subpalmatim ortis partim in lobos basales abeuntibus, ceteris pennatis omnibus crebre reticulato-anastomosantibus, forma magnitudineque valde variabilia, sed semper omnia petiolata, semper lobis basalibus manifestis praedita, 5—30 cm longa, 4—20 cm lata, aut scutata aut hastata aut sagittata, latitudine vix usque pluries longiora (vide varietates). *Folia inferiora* longe petiolata, petiolo laminam aequante usque interdum superante. *Folia superiora* sensim decrescentia. *Flores* polygami. *Pedicelli* fructiferi tenuiter filiformes, prope basin tenuiter sed manifeste articulati, longitudine variabiles, perigonium subaequantes usque eo (rarius) subduplo longiores. *Perigonii foliola exteriora* 1.5 mm longa, membranacea, late lanceolata, emarginationi basali valvarum accumbentia. *Valvae* fructiferae ex emarginatione (3.5—)4—5(—7) mm longae, 4—5(—7) mm latae, orbiculato-cordatae, basi anguste profunde emarginatae, margine integrae, apice rotundatae, consistentia tenaiteer reticulato-nervosae, pallide brunneae, interdum rufescentes, prope basin callo minutissimo subquadrato applanato reflexo praeditae. *Nux* matura brunnea usque atropurpurea, 2.5—3 mm longa, \pm 2 mm lata, in medio fere latissima, utrinque breviter acuminata.

Ethiopia.

Eritrea: Bet Ghirghis (BALDRATI 2189, FI). Guna-Guna, 2200 m (PAPPI 625, FI). Hamasen: Asmara (BALDRATI 550, 4713, FI); Sogro prope Asmara, nei cespugli di *Acacia abyssinica* presso Mai (CHIOVENDA 89, FI); At-Zien, 2500 m (PAPPI 5259, FI); Merara, 2500 m (DE BENEDICTIS 277, FI). Medriod-Tesfa: Adi Ghebsus (PAPPI 6525, FI). Mochi (BALDRATI 473, FI). Ocule-Cusai: Loggo Sarda, Deggahen, 2600 m (PAPPI 1421, 1422, FI). Saraè: Adi Gana, 1900 m (PAPPI 237, FI); Adi Ugri (BELLINI 45, FI). Scimezana: Monte Matara, 2440 m (PAPPI 911, FI).

Amhara: Bacino del lago Tana, Pianura ad Ovest di Zeghiè (PICHI-SERMOLLI 1562, FI). Dembia: valle Scinta supra Asosò boscaglie pantanose (CHIOVENDA 1886, 1887, FI). Goggiam: 12 km N. Debra Markos (TASCHDJIAN 225, FI). Semien: Debarek (..... 919, FI).

Galla-Sidaamo: Afrara (VATOVA 381, FI). Aghere-Salam—Uondo (VATOVA 641, FI). Barodda (VATOVA 1194, FI). Caffa: Anderaccia (SACCARDO 23, FI). Coromma prope Burgi (RIVA 1638, FI). Gimma (CHINI, SACCARDO 5,

MASSA 273, 301, FI). Neghelli (VATOVA 102, 172, FI). Praterie verso Soddu (VATOVA 1172, FI). Soddu-Barodda (VATOVA 1172, FI). Uollega: Sajo, Dembidollo (BENEDETTO 159, FI).

Scioa: Addis Abeba (SENNI 1868, FI); Zwischen Addis Abeba und Nilo Azurro, Arno (BUSCAGLIONI s.n., FI). Scioà—Harar (RAGAZZI 1326, FI). Entotto (SENNI 1817, FI). Guder (PIOVANO 306, FI). Oletta (westlich von Addis Abeba) (NEGRI 510, FI). Prati alpini sul Termaber (VATOVA 2360, FI).

Anglo-Egypt. Sudan.

»High up» on the Imatong hills (HUNTER 7382, K). Darfur, Dambillil, 2800 m (STEELE 28).

Brit. and French Cameroons.

Bamenda, 1850 m (MIGEOD 404, K). Distr. Buea, 1000 m, in bushland (MAITLAND 297, K). Cameroon Mt., Musaka Camp, 2900 m (MAITLAND 1289, K). Cameroon Mt., Ugunga Camp, 2550 m (MAITLAND 968, K). Yaunde-Station, 800 m (ZENKER et STAUDT 603, K (ex B)).

North Nigeria.

Plains between Hepham and Ropp, 1550 m (LELY 367, K).

Span. Guinea.

Bebao, Campogebiet, Ofan (TESSMANN 713, K (ex B)).

Belg. Congo.

Beni: Mayolo (BEQUAERT 3487, K (ex BR)). Eala (STANER 1575, K). Kamina-Lomami (QUARRÉ 3024, K). Kivu, Kabasha (LOUIS 5497, K). Kachonga, in montibus ad flumen Rusisi et lacum Kivu (FRIES 1526, UPS). Mahagi (LEBRUN 3840, K). Ruanda, Kigali (BECQUET 291, K), Ruanda, Kirinda (ROBYNS 2441, K). Urundi, Isare (ROBYNS 2293, K).

Uganda.

Kachwekano Farm, Kigezi, pasture, erect herb to 6 ft (J. W. PURSEGLOVE 3011, K); Bukasa, Sese, 1300 m, (occasionally planted) (A. S. THOMAS 879, K). Bukalasa, wet places, 1300 m (HANCOCK 2329, K). Bwamba Pass, 2000 m, in shade of scrub (A. S. THOMAS 679, K); ibidem 2700 m (FYFFE 13, K). Mt. Elgon, bamboo-zone, 3300 m (DÜMMER 3496, K). Kabale, Kigezi, short grass, 2000 m (HOPKINS 1176, K). Kivata, Ruwenzori, Toro Distr. (SCOTT-ELLIOT 7700, K). Kipayo, elephant grassland, 1300 m (DÜMMER 708, K). Mawokota, 1300 m (E. BROWN 180, K). Mt. Mgahinga, Kigezi, mountain scrub (J. W. PURSEGLOVE 2936, K).

Kenia.

Limuru, grass-bushland, 2300 m (DÜMMER 1689, K). Nairobi, Thompsons estate, 2000 m (E. R. NAPIER 404, K). Nieri, loco humido ad rivulum (FRIES 185, K, UPS). W-Ukamba, Machakos (LINDBLOM s.n., S).

Tanganyika.

Arusha Province, Embagai mt., 2700—2800 m (ST. CLAIR-THOMPSON 362, K). Karagwe (SPEKE & GRANT 418, K). Kilimanjaro, 2700—3000 m, Bismark hill to Marangu; growing amongst grasses in *Hypericum lanceolatum* and *Philippa excelsa* bush (GREENWAY 3893, K). Njombe (LYNES D.p. 186, K). Uluguru, Bunduki, 1500 m (BRUCE 586, K). Ufipa, near Sumbawanga, on summit of Ufipa Range, 2000 m (WEBB 84, PRE).¹ E.-Usambara, Sangerawe, growing with *Panicum maximum* in abandoned cultivation in mt. grassland and evergreen rain forest area (GREENWAY 2988, K). Nyassa-Hochland, Station Kyimbila, 1350 m (STOLZ 820, UPS).

Nyasaland.

Masuku Plateau, 2200—2300 m (A. WHYTE s.n., K). Namasi (K. J. CAMERON 3, K). Zomba Plateau, in bushy rain-forest regrowth, 1400 m (BRASS 16330, K, NY). Zambesia, Shire Highlands (BUCHANAN 383, K). Namasi, Mandala (CAMERON s.n., K).

North Rhodesia.

Near Mumbwa, 15° S, 28° E. (MACAULAY 319, K).

Angola.

Angola (WELWITSCH 5358, FI). Reg. Cuanza Sul, Amboim, Loc. Capir, 900 m. (GOSSWEILER 10044, K). Pungo Andongo, by the streams of Catate and Cabondo (WELWITSCH 5356, K). Nord-Angola: Galleriewald am Anhonca bei Camabatela (HESS 52/1115, ZT).

Madagascar.

Centr. Madagaskar (BARON 807, K, P). Centr. Madagaskar, Süd-Betsiléo, Wald von Ankaфина, in Sümpfen (HILDEBRANDT 3961, K, P); Ankaratra (HUMBERT 4533, P); Antsirabe (HUMBERT 7150, P); Angavo (DECARY 7339, P); Massiv de Tsiafajavona (PERRIER 2138, 8560, P).

I have seen the type specimen, now destroyed, and the interpretation of this species is also clear from the original description and picture, and the name has been used by most of the subsequent authors in the original sense.

R. abyssinicus is extremely variable in height of stem, size and outline of leaves and to a certain degree also in size of valves and nuts. Several varieties have been described by various authors. Some of them look quite distinct, but it is doubtful whether the majority really represent systematic entities, as clear morphological correlations are lacking and such combinations of characters as do occur are not limited to definite geographical areas, as far as I can see. The most outstanding of these,

¹ Forma valvis et nucibus minoribus.



Fig. 1. *Rumex abyssinicus* var. *angustisectus* ENGLER. Isotypus.

and some other varieties which I regard as »minor variations», are described here:

a.) *R. abyssinicus* var. *angustisectus* ENGLER, Hochgebirgsfl. trop. Afr. 203 (1892).

Folia anguste linearia, lobus medianus latitudine saepe ultra 10-plo longior; lobi laterales anguste lineares saepe valde elongati plerumque \pm horizontaliter patentes.

Ethiopia: Debra Tabor (SCHIMPER 1527, K, Isotypus). Kenya Colony: Grows in wastes and at roadsides, Soy, Turbo, Kipkarren, etc. (BRODHURST HILL 516, K). Congo Belge: Montagnes a l'Ouest du lac Kivu a Tshibinda, 2000 m (H. HUMBERT 7403 K, P, PRE).

This variety looks very distinct when represented by extreme individuals (BRODHURST HILL 516). But there are intermediates, as BALD-

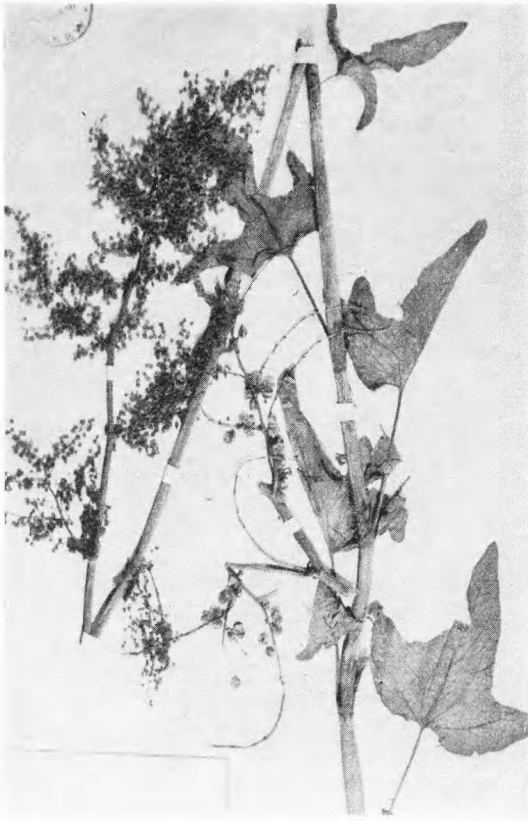


Fig. 2. *Rumex abyssinicus* var. *Kilimandschari* ENGLER. VOLKENS No. 423.

RATI 4713, in which only the uppermost leaves are linear-elongate, the lower ones corresponding to the average type of *R. abyssinicus*. I want to call attention to the occurrence of homologous narrow-leaved variations in several of the African representatives of Subgen. *Acetosa* (*nervosus* — *Elenbeckii*; *R. trinervius*, etc.).

b.) *R. abyssinicus* var. *Schimperi* (MEISN.) ASCHERS. in Schweinfurth, Beitr. fl. Aethiop. 171 (1867).

Syn. *R. Schimperi* MEISN. ap. DC. Prodr. 14: 67 (1856).

Planta humilis, 20—40 cm tantum alta. Folia parva ad 5 cm longa, ad 3 cm lata, triangulari-scutata, lobis basalibus brevibus acutis non divergentibus.

Etiopia: Amhara Auf Aeckern bei Debra Eski, 3100 m (SCHIMPER 514, K, NY, Typus); Scioa: Pendici di Entotto, 2900 m (L. SENNI 1817, FI); Gegend von Addis Abeba (OSSENT 25, ZT).

Galla-Sidamo: Prato tra Cencia e la conca di Dorze (A. VATOVA 1767, FI),
 Tra Cencia et Lago Margerita, prati umidi (A. VATOVA 1736, FI).
 Angola: Distr. Malange (J. GOSSWEILER 1025, K).
 Tanganyika: Mufindi, 2000 m (R. DAWICE 9403, K).

In this case, too, the type specimen is very impressive, but apparently no fruit character is correlated with the vegetative characters, and again there is no limitation to a special region or to an altitudinal zone. Specimens showing intermediate characters are not infrequent.

c.) *R. abyssinicus* var. *Mannii* ENGLER, Hochgebirgsfl. Afr. 203 (1892).

Folia subtus papilloso-puberula.

W Africa: Kamerungebirge, 1300 m (MANN 1217, K, Isotypus).
 Ethiopia: Galla-Sidamo: Praterie verso Soddu (A. VATOVA 1172, FI), Afrera (A. VATOVA 581, FI).
 Tanganyika: Northern Province, Kilimanjaro (GEILINGER 4435, K).

This variety is less pronounced. The type specimen corresponds in all respects except the papillosity to the most common form, as represented by JACQUIN's original drawing. Papillosity occurs here and there throughout the whole range of the species, sometimes covering the entire lower surface of the leaf, sometimes limited to the nerves.

d.) *R. abyssinicus* var. *Kilimandschari* ENGLER, Hochgebirgsfl. trop. Afr. 203 (1892).

»Ochrea valde elongata; foliorum lobis lateralibus angustioribus obtusis.»

Kilimandscharo, im Wald am Muebach, 1900—2200 m (H. MEYER 300, B, Typus).

I have not seen the type, which has probably been destroyed. But there is a specimen in Kew herbarium from Berlin herbarium named var. *Kilimandschari* by ENGLER himself, »Kilimandscharo, Marangu, 1500 m (VOLKENS 423)». This specimen does not fit the short description very well. I should describe the leaves rather as follows: »folia late triloba lobis in foliis inferioribus subaequalibus obtusiusculis, e basi late leviter cordata laminae margine inferiore valde convexa antrorsis». There is a similar specimen »cultivated from seeds collected near Addis Abeba, Aethiopia» in hort. bot. Genuens. (hb. FI).

e.) *R. abyssinicus* var. nov. *calystegiaefolius* RECH. F.
 Folia latitudine vix vel paulo longiora forma *Calystegiam* aemulanti, late cordata-hastata, lobis basalibus interdum indistinctis.

Etiopia: Eritrea: Seraè; Adi Ganá, 1900 m (PAPPI 237, FI, Typus).



Fig. 3. *Rumex abyssinicus*
v. *calystegiaefolius* RECH. F.
Typus.

f.) *R. abyssinicus* var. nov. *retrorsilobatus* RECH. F.

Folia latitudine sesqui- usque duplo longiora, supra basin paulum constricta, lobis basalibus deorsum flexis.

Ethiopia: Amhara: Dembia: valle Scinta sopra Asosò nelle (pr. Gondar) boscatie pantanose (CHIOVENDA 1886, FI, Typus).

I have not seen the type specimen of *R. hastatus* A. PETER, namely PETER 38768 from former German East Africa, Uka: Kwa Bikare to Urkigo, village Niakayaga, 1590—1615 m. The name is invalid in any case for there exists *R. hastatus* D. DON, Prodr. fl. Nepal. 74 (1875). I cannot see any specific difference between it and *R. abyssinicus*. *R. hastatus* A. PETER has been described and figured from a flowering specimen only. The differences mentioned by the author in his key, l.c., p. 196, are unreliable and limited to the shape of leaves, which he thought to be sagittate in *R. abyssinicus* and »hastate with horizontal

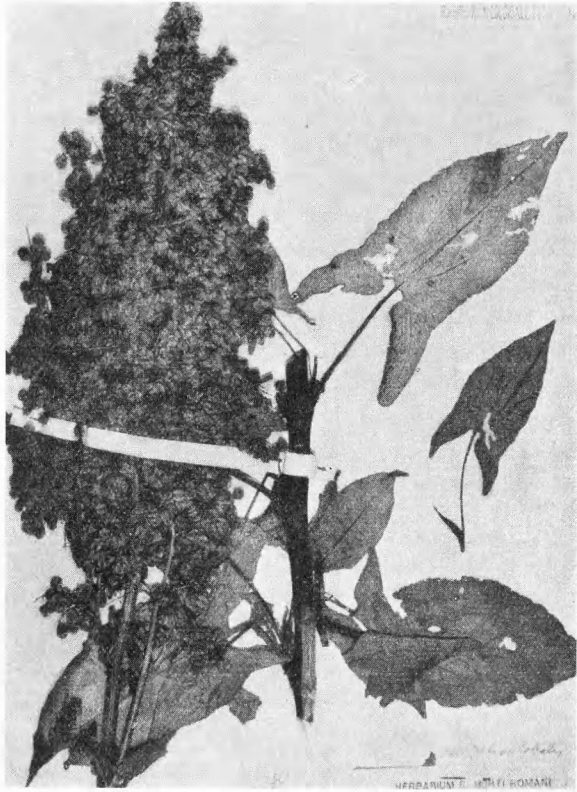


Fig. 4. *Rumes abyssinicus*
var. *retrorsilobatus* RECH. F.
Typus.

spreading lateral lobes» in *R. hastatus*. Neither this character nor the size of leaves and the very dense repeatedly branched inflorescence allow a specific separation from *R. abyssinicus*. I do not believe that PETER's plant deserves even the rank of a variety.

BECK in Reichenb., Icon. Fl. Germ. et Helv. 24: 52 (1909) has expressed the opinion that the type specimen of *R. abyssinicus* JACQ., formerly in the Vienna herbarium but lost by war accident, is a cultivated form of *R. arifolius* ALL. I have seen this specimen and can confirm that it agreed very well with JACQUIN's figure. I must therefore reject BECK's opinion, which has been quoted by different authors, e.g. by FRIES, Notizbl. Berl. Dahl. 9: 35 (1924).

Subsect. b. CAPENSES Rech. fil., ad interim.

Caules erecti, humiles. Flores monoici vel polygamo-dioici.

15. *Rumex cordatus* DESF.

DESF. in Cat. Hort. Paris ed. 2: 40 (1829); MEISN., *Linnaea* 14: 500 (1840); MEISN. ap. DC. *Prodr.* 14: 68 (1856); WRIGHT, *Fl. Capens.* 5/1: 476 (1912).

Syn.: *R. tuberosus* (non L.) THUNBG., *Prodr.* 67 (1794—1800) non vidi; *Fl. Capens.* ed. SCHULT. 341 (1807—13).

R. sarcorrhizus LINK, *Enum. hort. Berol.* 1: 351 (1821); MEISN., *Linnaea* 14: 501 (1840).

Rhizoma plerumque verticale, tenue, 2—10 cm infra terrae superficiem in bulbum oblongum vel crasse fusiformem rarius subglobosum incrassatum vel bulbos plures magnitudine variabiles proferens. Caulis erectus tenuis vel validus 10—45 cm altus, internodiis paucis \pm elongatis, foliis plurimis basi rosulato-congestis vel 1—4 caulinis evolutis; panícula laxa aperta aphylla ramis erectis plerisque non vel breviter pauciramosis, dimidium circiter superius caulis occupans. Folia ut videtur in vivo carnosa vel crasse herbacea, in sicco coriacea vel crasse membranacea; inferiora petiolo crassiusculo laminam plerumque circiter aequante suffulta, folia superiora sensim brevius petiolata. Lamina foliorum inferiorum 3—5(—6) cm longa, \pm aequilata, aut late ovato-cordata apice late rotundato-attenuata lobis basalibus rotundatis aut minora latitudine usque duplo longiora supra basin \pm panduriformi-contracta scutiformia a sinu basali magis aperto lobis interdum acutiusculis magis divergentibus apice acutiora. Folia caulina aut perpaucata et tunc subito decrescentia aut plura sensim decrescentia, brevius petiolata, proportione angustiora latitudine saepe pluries longiora lobis basalibus angustioribus magis divergentibus. Folia summa linearia vel oblongo-lanceolata, lobis reductis. Florum glomeruli pauciflori, flores polygamo-dioici. Pedicelli filiformes valvam fructiferam ad summum aequantes, saepe breviores, in tertia parte inferiore tenuiter articulati, infra basin perigonii subito paulo incrassati. Perigonii foliola exteriora 1.5—2 mm longa, 1 mm lata, obtusiuscula ovato-spathulata vel late lanceolata, basibus interiorum appressa. Valvae in statu fructifero magnitudine variabiles ex emarginatione 3—5 mm longae, 3—6 mm latae, e basi late leviter cordata subreniformi-orbiculatae, tenuiter membranaceae, integrae antice rotundatae, nervo mediano prope basin saepe indistincte subcalloso-incrassato sed non distincte callifero, nervatura reticulata tenuiter prominens e maculis subaequalibus omnibus fere isodiametricis composita. Nux 2—2.5 mm longa, 1—1.4 mm lata utrinque subaequaliter attenuata atrobrunnea.

Cape Province.

Alicedale (CRUDEN 62, GRA); Western slopes of the Apostles, Cape Peninsula (PILLANS 3615, PRE); Cape of Good Hope, Cape Flats, 200 ft. (ROGERS A 42, GRA); On the sands of the Cape Flats (ZEYHER or ECKLON s.n., PRE); Capetown (BOLUS 2911, K; ALEXANDER s.n., K; ECKLON et ZEYHER 64, 9, S); Port Elizabeth (CONVENT 9, GRA; FRIES, NORLINDH & WEIMARCK 448, LD), Prope Port Elizabeth, in convalle »Bethelsdorp Kloof» (FRIES, NORLINDH & WEIMARCK 246, LD); Kampsbaai, Mt. Oliphant (LUDWIG 41, S); Distr. Uniondale, North of Haarlem, 12 miles from Avonhuis, 2700 ft. (FOURCADE 4350, K); Bredasdorp, Nachtwacht-Farm in sandy soil near Klooster, 150 ft. (C. A. SMITH 3066, PRE); Bredasdorp, near Klooster, Nachtwacht-Farm, 150 ft. (C. A. SMITH 3018, PRE); Mossel Bay, Klein Berg, 800 ft. (GALPIN 4431, PRE); Västsidan af Taffelberget (HAFSTRÖM & LINDEBERG s.n., S); Sandig mark vid nordsidan af Bains Kloof (J. P. H. ACOCK 413, S); Table-Mount, 600 m (R. MARLOTH 7203, PRE).

In monte Leonis (no coll., 1831, S); Zwischen Gebüsch am Loewen (no coll., a. 1827, S); Sandige Gegend unweit Salzrivier (ECKLON s.n., S); Kloof between Storms Vlei and Bonnievalle (ohne Sammler, S); Sandy soil by the roadside between Touws River and Karoo Poort (P. H. ACOCKS 1703, S); Half way up N.-facing slopes below Uitkyk Pass, in the Cederberg (P. H. ACOCKS s.n., S); Granite hill N of Bottelary Road (ACOCKS 460, S); In convalle Hex River (H. BOLUS s.n., PRE); Near the west end of Groene Vallei, Knysna Distr. (BURCHELL 563 A., K); Sandige Gegend am Fuss des Tafelberges (ECKLON 710, S). In sabulosis prope Hopefield, 100 ft. (BOLUS 12811, K, PRE); Bulhoek, 700 ft. (SCHLECHTER 8380, PRE).

A series of specimens must be mentioned in connection with *R. cordatus*, which differ from that species by slender growth, less distinctly cordate, thinner leaves, which are up to nearly three times longer than large, and by diffuse panicles with usually very remote whirls. They form probably a distinct systematic entity: e.g.

Transvaal.

Ermelo, P. O. Thegem (E. F. WALKER 108, PRE); Krugersdorp, Witpoortjie (D. P. MURRAY 659, PRE); Ermelo, granite koppies (E. F. WALKER 143 (5), PRE); Middelburg (KASSNER 120, PRE).

Basutoland.

Leribe, slopes under rocks (A. DIETERLEN 466, PRE).

Natal.

Pietermaritzburg Div. (C. A. SMITH 8100, B, PRE); Distr. Alexandra, Station Dumisa, 800 m, Campbellton am Ipp (H. RUDATIS 1799, PRE); Hammadale, escape from cultivation (H. B. TAYLOR s.n., NH).

This plant has been sometimes mistaken for the European *R. Acetosa* L., which does not occur in South Africa as far as I know. Nor does the mediterranean *R. tuberosus* L. occur there.

R. cordatus, in the broad sense accepted here, is a rather polymorphic species. In the herbarium material available at present, I am able to distinguish three main types. Possibly at least two of them represent good species, but I dare not delimit them without knowing their range of variation, ecology, etc.

The first type, as represented by ACOCK 460, S, PILLAU 3615, PRE, is a stout plant with stem up to 45 cm, with most of the leaves assembled in a basal rosette, the leaves about as long as broad, up to 5—6 cm in diameter, and with obtuse or rounded basal angles (or if somewhat acute, not divergent). Stem leaves only one or very few in the lower part of stem, abruptly reduced. Panicle loose, occupying often more than half of the stem. Ripe fruits not seen.

The second type as represented by BOLUS 12811, ECKLON et ZEYHER 649, S, is similar, but more slender, with stem only half as high and leaves of half the size.

The third type, as represented by C. A. SMITH 3018, PRE, and HAFSTRÖM & LINDBERG s.n., S, is low and slender like the second, but usually more stem leaves are developed, the leaves are about twice as long as wide, somewhat contracted below the middle, and the basal lobes are often a little divergent.

Possibly ripe fruit could furnish specific characters. They vary in size, but from the material at hand I cannot decide whether size of fruits is correlated to habit and leaf-shape.

To judge from several indications on the labels type 1 occurs on a »granite hill» (ACOCKS 460) and respective »slopes» (PILLANS 3615), while type 2 is likely to prefer sandy places: »sandy mark» (ACOCK 413), »in sabulosis» (Bolus 12811).

16. *Rumex Woodii* N. E. BROWN.

N. E. BROWN in Kew Bull. 1909: 187 (1909).

Syn.: *R. natalensis* DAMM. ex J. M. WOOD in Trans. Roy. Soc. S. Afr. 3: 55 (1913), nomen nudum.

Rhizoma ut videtur pluriceps, radicibus fibris fusiformi-incrassatis ad 1 cm crassis vel ut videtur interdum omnino incrassatum. *Caulis* 30—70 cm altus, stricte erectus fistulosus crassus paucinodus, inter-

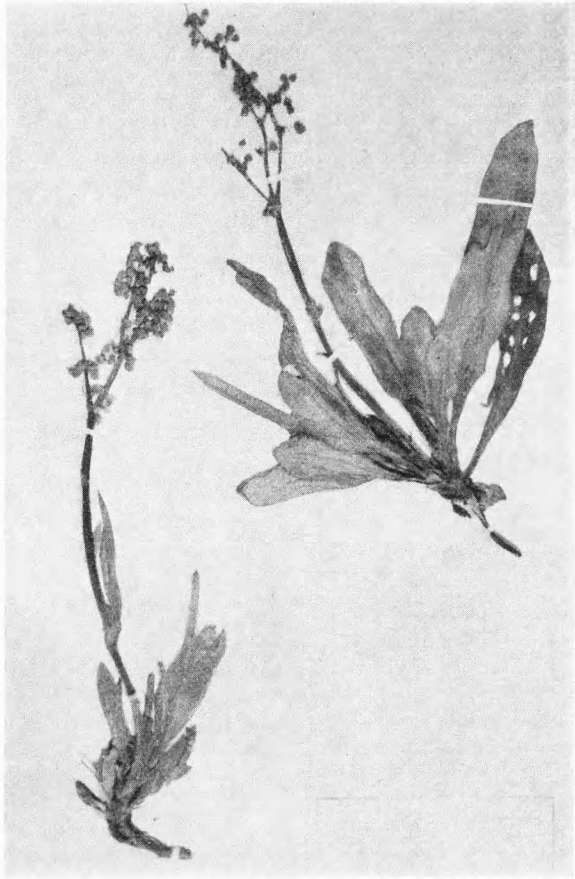


Fig. 5. *Rumex Woodii* N. E. BROWN. Isotypus of *R. natalensis*.

nodiis mediis saepe ultra 10 cm longis, grosse sulcato-striatus, a medio vel supra rarius iam infra pauciramosus, ramis subsimplicibus erectis aphyllis paniculam laxam apertam efficientibus. *Ochreae* pallide brunneae membranaceae caducae. *Folia omnia* consistentia in sicco coriacea, forma variabilia, sed basi plerumque vario modo attenuata, rarissime autem subhastata. *Folia basalia* petiolo crasso basi dilatato quam lamina plerumque multo breviora rarius \pm aequilongo suffulta, lamina 5—10 cm longa, 1—4 cm lata, ambitu ovato-lanceolata vel lanceolata (rarius lineari-lanceolata), basi anguste vel late cuneata, apice acuta, in speciminibus validis praeter costam medianam nervo utrinque parallelo arcuato percursa vel pennato-paucinervosa, nervis laxe usque indistincte reticulato-anastomosantibus. *Folia caulina*

non numerosa, saepius in tertia parte inferiore caulis tantum evoluta cito decrescentia, quam basalia proportione angustiora, acutiora, brevius petiolata. *Panicula* aphylla. *Verticillastri* pauciflori, flores dioici. *Pedicelli* fructiferi filiformes, arcuato-deflexi, quam valvae semper evidenter breviores, infra medium articulati. *Perigonii foliola exteriora* lanceolata reflexa, 2.5—3 mm longa. *Valvae* fructiferae late rotundato-cordatae, ex emarginatione 9—10 mm longae, 10—12 mm latae, basi profunde anguste cordatae, antice late rotundatae, integrae, basi callo minuto applanato reflexo truncato praeditae, tenuiter membranaceae subpellucidae, copiose tenuiter reticulato-nervosae, pallide stramineo-brunnescentes vel subcarneae vel purpureo-suffusae. *Nux* matura 5 mm longa, 2—2.5 mm lata, basi brevius apice longius acuminata, pallide fusca.

Transvaal.

Carolina, sandy patch, Bosmans River valley, 5500 ft. (E. E. GALPIN 12218, PRE); North and South of Carolina, as far as Robinsons, sandy soil, 5800 ft. (B.-DAVY 2714, K); Carolina, Leliefontein (NICHOLSON 4599, PRE); Carolina (ROGERS 19125, PRE). Distr. Ermelo, P. O. The Gem (B. F. WALKER 108 & 110, PRE); Ermelo, Granite Koppies (E. F. WALKER (5) 143, PRE); Ermelo (J. B.-DAVY 2003, PRE); Krugersdorp, Witpoortjie (D. P. MURRAY 659, PRE); WENNERSHOEK, Lydenburg (J. BURTT-DAVY 7625, PRE); Middelburg (KASSNER 120, PRE); Banks of Umhloti (M. WOOD 644, NH, Co-Type-Number).

Natal.

Cathedral-Peak-Area, 4800 ft. (Sch. 414, PRE); Cato Ridge, near railway-line (McCLEAN 27916, NH); Caversham (MOGG 2430, PRE); Estcourt (J. ERXLEBEN 27649, NH); Lidgetton (MOGG 1376, PRE); Distr. Loskop, Cathkin-Park Drakensberg (B. C. HOWLETT 95, PRE, NH); Maritzburg-Drakensberg (J. WAHLBERG s.n., S); Estcourt, Meteor-Ridge, Mooi River (MOGG 3169, PRE); Nottingham Road, Lions River, damp places on mountain sides, 5000 ft. (E. E. GALPIN 10872, PRE); Nottingham Road, »Shawlands« (P. G. S. COETZEE 4, NH); Nottingham Road, 4800 ft. (J. M. WOOD 8396, NH); Giants Castle Game Reserve, mountain grassland, 7000 ft. (O. WEST 1613, NH); Impendhla (C. E. LEVETTE 59, NH); Stafamasi (WOOD 644, K, PRE); Upper Ingela, 4000 ft., near Lambonjwa-River (WOOD 3583, K, NH, Co-Type-Number); Weenen Cty., Dalton Bridge, (J. P. H. ACOCKS 10771, PRE, NH); Weenen, Culwers (ROGERS 25293, GRA, K). Distr. Alexandra, Station Dumisa, 600 m, Fundort: Umgaye, trockene Weiden (H. RUDATIS 722, LD, S). Isotypus *R. natalensis*. Distr. Alexandra, grassy fields (GALPIN 10670, K, PRE).

Basutoland.

Leribe, slopes (DIETERLEN 466, PRE).

Orane Free State.

Bethlehem, 5000 ft. (PHILLIPPS 3203, PRE; A. J. RICHARDSON s.n., K).

Cape Province.

In graminosis planitiei summi Boschberg, 4500 ft. (M. OWAN 1857, K); Mt. Currie, occasional in Protea veld (A. P. GOOSSENS 230, PRE); East London: Selbourne, 150 ft., (C. A. SMITH 3699, PRE); East London (M. G. RATTRAY 681, GRA); Distr. Kentani, 100 ft., Coast, marshy ground (PEGLER 725, PRE); In graminosis inter Riet River et Visch River (MACOWAN 1447, PRE, GRA); Stutterheim, 3 miles from Anabele (DE VRIES 4, GRA); Culvers (F. A. ROGERS 28293, GRA).

R. Woodii is indeed very similar to *R. cordatus* DESF. It differs as already pointed out by the author, by the lanceolate leaves, narrowed at the base, and by larger flowers and fruits. — There are however some specimens, which have apparently larger flowers or fruits as *R. cordatus* but leaves with hastate base, e.g.

C a p: Lilliefontein, Carolina (G. NICHOLSON 4599, PRE); Grassy valleys near Komgha, 2000 ft. (H. G. FLANAGAN 341, PRE); Distr. Kentani, 100 ft. coast, marshy ground (PEGLER 1901/725, PRE); East-London (G. RATTRAY 681, GRA); East-London, Selbourne, 150 ft. (C. A. SMITH 3699, PRE).

E. - G r i q u a l a n d: »Vielsalm», New Amalfi, ripen (H. M. FORBES 1125, NH).

On the other hand some of the specimens with typical lanceolate leaves have the fruits not as large as the type of *R. Woodii*, e.g.

N a t a l: Cathkin Park, Drakensberg (B. & C. HOWLETT 95, NH, PRE); Pietermaritzburg, Drakensburg (WAHLBURG s.n., S); Cathedral Peak Area, 4800 ft. (SCHULZE 414, PRE).

T r a n s v a a l: Middelburg (KASSNER s.n., BR).

The material available is not sufficient to decide whether these plants form distinct systematic entities or whether *R. cordatus* and *R. Woodii* should be united on account of these quasi intermediate forms.

17. *Rumex lativalvis* MEISN.

MEISN. in *Linnaea* 14: 497 (1840) incl. var.; MEISN. ap. DC., *Prodr.* 14: 67 (1856); WRIGHT, *Fl. Capens.* 5/1: 477 (1912).

Radix tenuis, fibris napiformi-incrassatis sessilibus 2—3.5 cm longis, 0.5—1 cm crassis, apicem versus attenuatis. *Caulis* 15—20(—30) cm altus, erectus vel ascendens, flexuosus, tenuis, saepe fere a basi pauciramosus vel caules plures evoluti, tenuissime sulcato-striatus, pauci-

nodus, nodis incrassatis, internodiis mediis plerumque 3—5 cm longis, virescens saepe purpureo- vel violaceo-suffusus; rami inferiores saepe elongati, furcati vel pauciramosi, arcuato-divergentes, tenues, \pm flexuosi, aphylli, paniculam laxam apertam formantes. *Ochreae* pallide brunneae, tenuiter membranaceae, patulae, diu persistentes. *Folia omnia* longe tenuiter petiolata, plerumque angustissime linearia, hastata, lobis basalibus perlongis laminam latitudine subaequantibus fere rectangulariter patentibus rarius paulum reflexis, leviter sursum curvatis vel subrectis. *Folia basalia* numerosa, extima plerumque proportione breviora et latiora, petiolis 2—5 cm longis suffulta, lamina 1—3 cm longa, 1.5—2.5 mm lata, lobi basales 0.4—1.6 cm longi, 0.5—1.5 mm lati. *Folia caulina* similia paulo decrescentia, brevius petiolata. *Inflorescentia* aphylla. *Verticillastri* pauciflori. *Pedicelli* fructiferi tenuiter filiformes deflexi, quam valvae plerumque breviores, infra medium vel prope basin tenuiter articulati. *Flores* monoici. *Perigonii foliola exteriora* \pm 1 mm longa, anguste lanceolata, \pm reflexa vel patula. *Valvae* in statu fructifero late rotundato-cordatae, 3—4 mm longae, ad 5 mm latae, basi emarginatae, apice subrotundatae vel acutiusculae, tenuiter membranaceae, tenuissime reticulato-nervosae, integerrimae, ecallosae, pallide brunneae. *Nux* matura ca. 2 mm longa, ca. 1 mm lata, atrobrunnea, basi brevius, apice longius acuminata.

Cape Province.

Cap (ZEYHER 3622 C, W, G). Cape Town (R. MARLOTH 7274, PRE). Stellenbosch division, Faure, in low shrubby growth (R. N. PARKER 3975, K). Clanwilliam, 100—130 m (ECKLON & ZEYHER s.n., GRA; R. SCHLECHTER 8408, GRA, PRE, P). Foot of Olifants River Mts. near Warm Baths (E. L. STEPHENS 7300, K). Van Rhynsdorp, Klaver, Sandveld, open ground, 50 m (H. ANDREAE 404, PRE). Dunes at Still Bay near Riversdale (J. MUIR 4511, PRE). Near Duinefontein (A. H. WOLLEY Dod. 1861, K). Klinghardt Mts. (K. DINTER 3926, PRE). Redhouse (J. V. PATERSON 84, GRA). Felsige Bergplätze bei Kasparskloof, 2000—3000 ft. (DRÈGE s.n., NY, Typus var. *megalotys* MEISN.).

Differs from the other South African *Acetosae* by its slender habit, short pedicels and small valves. The leaves vary in outline and breadth, but I think that the varieties proposed by MEISNER hardly deserve taxonomic rank.

Subsect. c. SAGITTATI Rech. fil., ad interim.

Caules scandentes. Flores dioici.

18. *Rumex sagittatus* THBG.

THBG. in Prodr. Plant. Capens. 67 (1714); THBG., Fl. Cap. ed. SCHULT. 341 (1825); MEISN. in Linnaea 14: 498 (1840); MEISN. ap. DC. Prodr. 14: 68 (1856) incl. var. *latilobus*; WRIGHT, Fl. Cap. 5/1: 474 (1912).

R. luxurians LINN. F., Suppl. 212 (1781) non L., Mantissa 64 (1767), fide WRIGHT.

R. Burchellii CAMPD., Mon. Rum. 135 (1819).

Radix tuberosa. *Caulis* saepe valde elongatus, ultra 1 m longus, flexuosus \pm scandens, ex axillis foliorum saepe caules abbreviatos steriles vel serius florentes emittens, viridis vel purpureo-suffusus, tenuiter striato-sulcatus, internodiis mediis 5—10 cm longis. *Ochreae* brunneae membranaceae valde caducae. *Folia omnia* ut videtur in vivo tenuiter molliter herbacea laete viridia, in sicco tenuiter membranacea colore immutata vel leviter brunnescentia, longe petiolata; petiolus laminam subaequans usque ea dimidio brevior; lamina hastata 4—8—10 cm longa, 3—5 cm lata, basi late et profunde cordata, lobis basalibus deflexo-divergentibus valde acutis ad 2.5 cm longis, lateralibus rectis rarius paulo convexis vel concavis, sensim in apicem acutissimam longam producta; nervatura tenuis, subtus pallidior paulum prominens palmato-pennata, nervi infimi e basi laminae orti utrinque bini in lobos basales abeuntes, par aliud etiam e basi ortum quam medianum vix tenuius arcuato-antrorsum saepe ultra medium laminae productum mediano \pm parallelum, nervorum paria superiora tenuiora saepe plus minus evanescentia; folia superiora sensim angustiora et acutiora. *Inflouescentia* ampla aperta, ramis primariis angulo \pm recto divergentibus iteratim divaricate flexuose ramosis paucifoliatis. *Glomeruli* pauciflori. *Flores* dioici. *Pedicelli* fructiferi tenuiter filiformes, in tertia circ. parte inferiore tenuiter articulati. *Perigonii foliola exteriora* latiuscule lanceolata, reflexa, 2 mm longa. *Valvae* fructiferae e basi profunde anguste cordato-emarginata 4—7 mm longae, 6—9 mm latae, ambitu orbiculatae, integerrimae, tenuiter membranaceae, pallide brunneae vel \pm purpureo-suffusae, nervatura tenuiter reticulata, maculis nervaturae omnibus isodiametricis, nervo tenui marginali continuo. *Nux* matura pallide brunnescenti-cinerascens, ad 3 mm longa, ad 1.3 mm lata, apice breviter, basi longius attenuata.

South Rhodesia.

Inyanga Distr.: Mt. Inyangani, in silva ad rivulum, 2000 m (NORLINDH & WEIMARCK 5072, LD); prope pagum Inyanga, in valle rivuli, 1700 m (NORLINDH & WEIMARCK 4484, LD); Inyanga, in colle saxatili dumoso 1700 m. Pl. scandens (NORLINDH & WEIMARCK 2458, LD). Makoni-Distr.; ad villam

Duniden, in colle in silva sicca, 1800 m (NORLINDH & WEIMARCK 4938, LD). Manica-Distr.: Umtali Div., Odzani River Valley (TEAGUE 441, K). Distr. Salisbury: Salisbury (RATTRAY 519, PRE); Salisbury, a soft and brittle Rambler, weed of garden, 1600 m (EYLES 2139, K) among rocks, in shade (EYLES 4865, K). Melsetter (SWYNNERTON 1506, K). Umsweswe, 1200 m (BORLE s.n., PRE). Zimbabwe Ruins (HUTCHINSON & GILLET 3323, K).

Transvaal.

Mt. Anderson, Gold camp (POLE-EVANS 3828, PRE). Distr. Barberton: Kaap River, 800 m (THORNCROFT 2149, PRE); Rimers Creek (WILLIAMSON 240, PRE). Reg. Ermelo (Pupils of Convent 154, PRE). Reg. Nelspruit, Schagen (LIEBENBERG 2946, PRE). Krugersdorp, farm Gladysvale, 10 ft. vine crawling up in trees (RODIN 3942, PRE). Distr. Potchefstroom: Nooitgedacht, on moist sand on island in Vaal River (LOUW 1703, PRE), Losberg (LOUW 1445, PRE). Distr. Lydenburg: Stadt, Gebusch am Steckspruit (WILMS 1279, K). Pietersburg, Duivelskloof (GALPIN 10088, PRE). Distr. Pretoria: Fountains Valley (REPTON 271, 563, PRE; FORBES 345, NH), in *Acacia caffra* up to 7 ft. (VERDOORN 760, PRE), Vlak Fountain near Amersfoort (BURTT DAVY 4041, K); Debbes Ravine, 1600 m (MOGG 16098, PRE); Groen Kloof (MOGG 10018, PRE); Pretoria (POLE EVANS 1430, PRE); Southern slopes of Magaliesberg (MOGG 15135, PRE); Waterkloof (VERDOORN 112, PRE). Reg. Rustenburg: Zwartrug-gens, Elands River Bank, 1300 m (SUTTON 843, K, PRE). Sabie (BURTT DAVY 1546, K, PRE); Lydenburg, the Kloof, 5200 ft. (GALPIN 12247, PRE).

Swaziland.

Hlatikulu (STEWART 97, K).

Natal.

Natal (GERRARD 300, K). Distr. Alexandra, Stat. Dumisa, Farm Friedenau, Waldränder, 600 m (RUDATIS 619, K, S, UPS). Bluff, Durban (OGILVIE 9, D). Buffalo-River, 1700 m (ROGERS 41, GRH). Culvers, Weenen Div. (ROGERS 28459, K). Dundee, Blesboklaagte, 1300 m (CODD 2416, PRE). Durban North (FORBES 556, NH). Estcourt-Distr., Vechtlager, near Dalton Bridge, 1500 m (ACOCK 10048, NH). Grahamstown (MAC OWAN 527, NH). Greytown Distr. (WYLIE s.n., NH). Inanda, 600 m (WOOD 96, K). Distr. Kettlefountain, Maritzburg, 1200 m (Bot. students 7, NH). Loskop-Distr. Cathkin Park, Drakensberg (HOWLETT 62, NH, PRE). Lidgetton (D. BROWN 300, NH). Tugela Valley, 1700 m (MCCLEAN & BAYER 49, K, GRH). Margate (RUMP s.n., NH). Port Shepstone, Oribi Gorge (MCCLEAN 449, D, PRE). Tweedie, 2100 m (MOGG 4846, PRE); Tweedie (MOGG 6840, PRE). Warley Common, Mooi River (MOGG 7204, PRE). Winkle-spruit (LANSDELL s.n., NH). Zululand, Babanango, straggling over small trees to about 5 m (KING 449, NH). Zululand, Eshowe (LAWN 403, NH). East Zululand, Reg. Plaston (HOLT 225, D).

Basutoland.

Leribe, slope, ravine, 1700—2000 m (DIETERLEN 39, K, GRH, PRE).

Orange Free State.

Orange Free State (COOPER 1073, K); Kroonstad Distr., near Vals River (J. W. PONT s.n., U).

Cape Province.

Distr. New Agatha, 1300 m (MC. CALLUM 503, PRE). Near Albertinia (MUIR 1291, PRE). Bedford (NICOL s.n., GRH). Eastcourt-Distr., Tabamhlope Mt., 1700 m (WEST 91, PRE). East-London, Second Creek (RATTRAY 667, GRH). Grahamstown, 600 m (ROGERS 1584, K), S. Afr. Exch. Cl. 198, K), ibidem, 700 m inter frutices subscandentes (MAC OWAN 1944, GRH, K, UPS). Humansdorp, Slang River, damp places (PHILIPPS 3398, K, PRE), ibidem, Zitzikama, Storm river (GALPIN 9488, PRE; FOURCADE 648). Keiskama Hoek, Wolf Ridge, forests, 1000 m (STORY 3451, PRE). Kentani Distr., 500 m (PEGLER 264, GRH, PRE). Kings-Quarry (BUNIN 481, KRH). Distr. Komgha, 700 m (FLANAGAN 6540, K, GRH, PRE). Distr. Knysna, Koetzie (KEET 684, GRH, PRE). Knysna (WILLIAMSON 141, GRH). Distr. Uitenhage: in montibus Winter Hoek Mts ((FRIES, NORLINDH, WEIMARCK 845 LD). Uitenhage, Urwalder von Krakakamma, zwischen Port Elizabeth und Vanstaadesberg unter 500 ft. (ECKLON & ZEYHER 3, L, GRH, S, UPS). Pondoland, between St. Johns River and Umsikaba (DREGE s.n., K, S). Port St. Johns (WOOD 63, GRH). Rooi zuring, Knysna (MARLOTH 8474, PRE). Steynsburg, 700 m (SCHONLAND 3226, GRH, PRE). — Zuurberg, near Sanatorium, damp slopes (SCHONLAND 3226, GRH). Shilolvane (JUNOD 646, PRE). Grootvadersbosch (MARLOTH 3523, PRE).

Cultivated: Java, Mt. Tengger, Nougho Djadjar, 1230 m (BUYSMAN 3053, U).

Without locality: Catal. geogr. plant. Afr. austral. extratrop. (BURCHELL 1890, NY, Typus *R. Burchellii* CAMPD.).

This species is easily recognized by the flexuous more or less scandent stem. Outline of leaves varies considerably. MEISNER has proposed in Linnaea, l.c., several varieties (*angustilobus*, *megalotys*, *latilobus*, *cordifolius*, the types of which are preserved in hb. NY) which should be treated as »minor variants» hardly deserving a taxonomic status. The valves vary considerably in size but in this respect, too, I can see no necessity for distinction of lower taxonomic entities.

Sect. E. Insectivalves.

RECH. FIL., in Candollea 12: 32 (1949) (charact. mutat.).

Annui, dioici. Perigonii foliola exteriora reflexa. Valvae fructiferae longitudine duplo latiores, trilobae, lobo mediano triangulari-lingulato acuto, lateralibus late oblique rotundato-quadratis aliformibus.

19. *Rumex Papilio* Coss.

Coss. in Bull. Soc. Bot. Fr. 20: 260 (1873).

Radix annua. *Caulis* singulus vel plures, 20—45 cm altus, erectus, fistulosus, herbaceus, tenuiter sulcato-striatus, strictus vel leviter angulato-flexuosus, internodiis mediis 4—6 cm longis, saepe a basi fere tenuiter iteratim ramosus. *Folia omnia* in vivo ut videtur crassiuscule herbacea, in sicco membranacea, glabra, tenuiter pennato-reticulato-nervosa, in sicco pallide glaucescenti-viridia, angustissime cartilagineo-papilloso-marginata. *Folia basalia* et *caulina inferiora* petiolo laminam aequante usque sesqui- (rarius subduplo) longiore suffulta; lamina 2—4(5) cm longa, 0.5—1.5(2) cm lata, forma magnitudineque variabilis sed semper hastata, lobis basalibus semper acutis angustis vel latis, longis (ad 1.5 cm) vel brevissimis (3 mm), horizontaliter patentibus vel deflexis; lamina supra lobos basales plerumque \pm constricta, sursum paulo dilatata, apice plerumque rotundata-acuminata. *Ochreae* albae, tenuiter membranaceae, laxiusculae, caducae. *Folia caulina* superiora pauca, diminuta, brevius petiolata, ramos inflorescentiae fulcrantia. *Inflorescentia* laxa aperta, e ramis tenuibus saepe flaccidis inferioribus saepe elongatis iterum ramosis composita. *Flores* in axillis ochrearum minutarum pauci, bini usque quini, saepissime terni; verticillastra inferiora remota, superiora approximata. *Pedicelli* fructiferi tenuiter filiformes, recurvi, saepius atropurpurascens, 3—6 cm longi, quam valvae saepius breviores, plerumque infra medium tenuiter articulati. *Perigonii folia exteriora* in statu fructifero libera, reflexo-patula, anguste acute lanceolata, 2—2.5 mm longa. *Valvae* ex emarginatione basali ad apicalem \pm 5 mm longae, 7—11 mm latae, tenuissime membranaceae subpellucidae, medio pallescentes, marginem versus intense roseo- vel purpureo-suffusae, tenuissime laxiuscule reticulato-nervosae, basi late, apice anguste profunde emarginatae, in tertia circiter parte anteriore utrinque profunde (ad 3 mm) anguste incisae, inde ambitu quasi papilionaceae, margine minute eroso-denticulatae; basi prope emarginationem callo minuto subquadrato reflexo pallido parum prominente provisae. *Nux* pallide brunnea nitida, \pm 3 mm longa, vix 1.5 mm lata, basi brevius apice longius acuminata.

Morocco.

Atlas maior: In convalle fluminis Ait Messane, in declivibus lapidosis aridis prope pagum Tinitine, ca. 1400—1500 m (H. LINDBERG 3645, LD); Grand Atlas: Entre Oumenart & Amismiz, ca. 800 m (MURBECK s.n. LD); Env. de Marrakech:

Djebel Gueliz (MURBECK s.n., LD); Env. de Marrakech: au pied du Djebel Gueliz (MURBECK s.n., LD); Env. de Marrakech: Colline calcaire dans la palmeraie (MURBECK s.n., LD); Oued Jssen (Sous), 200 m (JAHANDIEZ 281^{bis}, LD); Distr. australi-occidentalis macaronesicus: Tigert prope Cap Ghir, in arganieto, ca. 350 m (SAMUELSSON 6485, LD.); Distr. boreali-centralis: Oued Beht, ad marginem viae prope Bataille, ca. 300 m (SAMUELSSON 7270, LD); Chaouia: Bou Laouane (MURBECK s.n., LD); Rio Nekor, Route d'Alhucemas, marges (SENNEN & MAURICIO 8013, W).

R. Papilio is similar in its annual growth and lobate valves to *R. Rothschildianus* AARONSOHN ap. EVENARI growing in Palestine (see RECH. F., Candollea 12: 32 (1949)). *R. Rothschildianus* differs, in addition to other characters, in its connate and strictly reflexed outer perianth segments.

Sect. F. Vesicarii.

LÖVE in Bot. Notis. 1944: 240 (1944).

Annui. Flores hermaphroditi. Valvae fructiferae maximae membranaeae rotundato-ovatae vel cordatae eximie reticulato-venosae. Fructus interdum bini (vel terni) plerumque concreti.

20. *Rumex vesicarius* L.

L., Spec. Plant. ed. 1: 336 (1753); CAMPD., Monogr. Rum.: 69, 129 (1819); MEISN. ap. DC., Prodr. 14: 70 (1856) p.p.; MURB. in Lunds Univ. Årsskr. n. F. Avd. 2, 2, No. 14: 9 (1907).

Pedicelli in quaque ochrearum axilla semper singuli. *Flores* in apice pedicellorum semper bini rarius terni. *Valvae* fructiferae floris primarii subaequales suborbiculares 12—18(—23) mm longae et latae, nervo marginali destitutae, lobis basalibus parallelis, duae basi callo sat parvo praeditae, tertia nuda, omnes extrorsum longitudinaliter complicatae callos et florem secundarium omnino occultantes. *Nux* floris primarii 3.5—4.7(—5.2) mm longa griseo-brunnea, floris secundarii 2.8—4(—4.5) mm longa, saturatius colorata.

Distr. geogr.: Punjab, Afghania, Belutchia, Persia australis, Arabia, Graecia(?), Africa borealis. — Tab. geogr.: Murb. l.c., tab. 2, fig. 1 (1907).

21. *Rumex simpliciflorus* MURB.

MURB. in Contr. Tun. etc. 3 (Act. Reg. Soc. Physiogr. Lund Tom. 10): 11 (1899) et in Lunds Universitets Årsskrift, N.F., Afd. 2, Bd. 2, No. 14: 15 (1907). Syn.: *R. vesicarius* var. *singuliflorus* MEISN. in DC. Prodr. 14: 71 (1857).

Planta annua, glaberrima, glaucescenti-viridis, basi in caules crassiusculos, arcuato-ascendentes vel suberectos, 0.5—5 dm longos, plus

minusve ramosos divisa. Caules ramique inflorescentiis racemiformibus aphyllis, multifloris terminati. Folia carnosula, integerrima, obtusa vel acuta, inferiora ovato-rotundata, ovata vel ovato-triangularia, superiora nunc ovata nunc deltoideo-lanceolata vel subhastata. Ochreae flori-ferae e basi amplexicauli ovatae vel lanceolatae, acuminatae. Pedicelli in quaque ochrearum axilla bini — quaterni, graciles, infra medium articulati. Flores fere omnes hermaphroditi vel in summa inflorescentiarum parte masculi vel masculis intermixti, in singulis pedicellis semper solitarii, numquam geminati. Perigonii fructiferi phylla exteriora oblonga, reflexa. Valvae (phylla interiora) subaequales, orbiculares, 5—9(—11) mm longae et latae, subcartilagineo-membranaceae vel membranaceae, hyalinae vel saepius rosaceae, vulgo nitidulae, venis anastomosantibus reticulatae, nervo marginali destitutae, omnes basi callo parvo deflexo triangulari-rotundato munitae, planae vel extus concavae, rarius extrorsum longitudinaliter complicatae, apice emarginatae, basi cordatae, lobis basilaribus phylla perigonii exteriora non vel haud multum superantibus. Nux 2.5—3.7 mm, rarius ad 5 mm longa, griseo-brunnea, lateribus omnibus aequilatis, convexiusculis, lanceolatis, angulis acutissimis vel superne subalatis.

Distr.geogr.: Africa borealis, Arabia.

R. simpliciflorus var. *typicus* MURB., Lunds Universitets Årsskrift, N.F., Afd. 2, No. 14: 16 (1907).

Folia inferiora late ovata vel rotundato-ovata, obtusiuscula, basi subtruncata, superiora ovato-deltoidea, acutiuscula, basi subcuneata. Valvae 5—9 mm longae, subcartilagineo-membranaceae, laxiuscule reticulatae, planae vel extus leviter concavae, callo non occultato. Nux 2.5—3.7 mm longa, angulis acutissimis sed non alatis.

Icon.: Murb., Contr. Tun. etc. 3: tab. 11, fig. 8—10 (1899); Murb., Lunds Universitets Årsskrift, N.F., Afd. 2, Bd. 2, No. 14: Fig. 7—9 (1907).

Distr.geogr.: Africa borealis, Arabia.

R. simpliciflorus var. *maderensis* MURB., Lunds Univ. Årsskr., N.F., Afd. 2, Bd. 2, No. 14: 17 (1907).

Planta plerumque elata, 2—5 dm alta, caulibus ramosissimis, ramis suberectis. Folia acuta, inferiora ovato-triangularia, basi truncato-cuneata, superiora deltoideo-lanceolata vel subhastata, basi cuneiformia. Valvae 7—11 mm longae, membranaceae, venis anastomosantibus dense reticulatae, extrorsum longitudinaliter complicatae, callum minutum occultantes. Nux 3.7—5 mm longa, angulis acutissimis vel superne subalatis.

Distr.geogr.: Ins. Madeira.

R. simpliciflorus var. *libycus* MURB., Lunds Univ. Årsskr., N.F., Afd. 2, Bd. 2, N. 14: 17 (1907).

Folia obtusa, inferiora ovato-rotundata, basi truncata vel subcordata, superiora late ovata, basi truncato-rotundata. Valvae 8—11 mm longae, membranaceae, venis anastomosantibus dense reticulatae, extrorsum longitudinaliter complicatae, callum minutum occultantes. Nux 2.5—3.5 mm longa, angulis acutissimis sed vix alatis.

Distr.geogr.: Aegyptus superior.

R. simpliciflorus var. *planivalvis* (MURB.) SAM., Bot. Notis. 1939: 521 (1939).

Syn.: *R. planivalvis* MURB., Lunds Univ. Årsskr., N.F., Afd. 2, Bd. 2, No. 14: 14 (1907).

Flores geminati; valvae floris primarii inaequales, eas floris secundarii (vel tertiarii) non occultantes.

Distr.geogr.: Algeria, Tunesia, Reg. Touareg, Tripolitania.

22. *Rumex cyprius* MURB. ssp. *disciformis* SAM.

SAM. in Botan. Notis. 1939: 512 (1939).

Syn.: *R. roseus* L., Syst. nat. ed. X, 2 (1759), p. 990, et aut. plur. post-Linn., e.g. MEISNER (1857, p. 71), BOISSIER (1879, p. 1018), MURBECK (1907, p. 21); non L., Sp. pl. ed. I (1753), p. 337, qui *R. tingitanus* L., Syst. nat. ed. X, 2 (1759), p. 991.

R. vesicarius L. ssp. *roseus* HOLMBOE Stud. Veg. Cypr. 64 (1914).

R. roseus L. ssp. *euroseus* MAIRE Bull. Soc. Hist. Nat. Afr. Nord 16: 378 (1937).

Folia acuta, plus minus triangularia. *Pedicelli* in quaque ochrearum axilla semper singuli. *Flores* in apice pedicellorum semper bini (vel terni), secundarius quam primarius multo minor. *Valvae* floris primarii valde inaequales; valva maxima suborbicularis, 9—21 mm longa, 9—23 mm lata, apice basique profunde emarginata, lobis basilaribus fere semper contiguus vel sese tegentibus, phylla exteriora saepius multo superantibus; valvae omnes planae vel extus leviter concavae, nunquam longitudinaliter complicatae, plus minusve rosaceae, venis anastomosantibus, primariis mediocribus, dense reticulatae, margine nervo mediocri roseo spinuloso vel irregulariter dentato munitae; duae maiores basi callo parvo triangulari-rotundato praeditae, tertia (florem alterum attingens) ecallosa. Valvae floris secundarii omnes parvae, 4—7 mm longae. Nux plus minusve brunnea, floris primarii circ. 3.5—4.5 mm longa, secundarii 3—4 mm longa, utraque lateribus exterioribus convexiusculis lanceolatis, latere interiore plano ovato-lanceolato, angulis acutissimis superne subalatis.

Distr.geogr.: Aegyptus, Sinai, Palaestina, Syria, Ins. Cyprus, Kurdistania, Mesopotamia, Persia australis.

Rumex cyprius MURB. ssp. *coloratus* SAM.

SAM. l.c., 516. Fig. 1 h.

Folia acuta, ovato-triangularia, basi subtruncata. *Pedicelli* in quaque ochrearum axilla semper singuli. *Flores* in apice pedicellorum semper bini, secundarius quam primarius paulo minor. *Valvae* inaequales, duae maiores cuiusque floris suborbiculares, 10—15 mm longae, 10—15 mm latae, apice basique profunde emarginatae, lobis basilaribus parallelis non vel fere contiguis phylla perigonii exteriora multo superantibus, extus concavae usque plus minusve extrorsum longitudinaliter complicatae, rosaceae, venis anastomosantibus intense coloratis, primariis validis, dense reticulatae, margine nervo valido intense colorato spinuloso-dentato munitae, callo parvo triangulari-elongato praeditae, valva tertia cuiusque floris (florem alterum attingens) parva ecallosa. *Nux* brunea, floris primarii circ. 4.5 mm longa, secundarii 3.5 mm longa, utraque lateribus exterioribus convexiusculis ovato-lanceolatis, latere interiore plano ovato, angulis acutissimis superne subalatis.

Sahara algeriensis in viciniis oasis Biskra (CH. SCHMITT in Fragm. Fl. Alg. exs. n. 93 pp.: Herb. K).

Rumex cyprius MURB. ssp. *subinteger* SAM.

SAM. l.c., 517.

Syn. *R. roseus* L. var. *integer* MAIRE (1937, p. 378). Fig. 1 i, 2 a.

Folia obtusa, late ovata, basi subtruncata. *Pedicelli* in quaque ochrearum axilla semper singuli. *Flores* in apice pedicellorum vulgo bini, secundarius quam primarius sat conspicue minor (in summa tantum parte inflorescentiae interdum solitarii). *Valvae* florum geminatorum inaequales, duae maiores cuiusque floris suborbiculares, 8—13 mm longae, 8—13 mm latae, apice basique profunde emarginatae, lobis basilaribus parallelis non contiguis phylla perigonii exteriora vix usque conspicue superantibus, saltem floris secundarii interdum plus minusve extrorsum longitudinaliter complicatae, intense rosaceae, venis anastomosantibus roseis, primariis mediocribus, dense reticulatae, margine nervo mediocri sat raro et brevissime denticulato munitae, callo parvo triangulari praeditae, valva tertia cuiusque floris (florem alterum attingens) parva ecallosa; valvae solitariorum magis aequales, praeterea valvis maioribus florum germinatorum similes. *Nux* pallide brunnea, floris primarii circ. 4 mm longa, secundarii circ. 3 mm longa (in floribus solitariis usque

4.5 mm longa), utraque lateribus exterioribus convexiusculis, latere interiore plano, omnibus ovato-lanceolatis, angulis acutissimis superne subalatis.

Sahara austro-occidentalis: In rupibus ad Hank meridiem versus a Chegga (MONOD n. 5373: Herb. Alger, fragm. etiam in Herb. S).

Rumex cyprius MURB. ssp. *conjungens* SAM.

SAM. l.c. 518.

Syn. *R. roseus* MAIRE (1930, p. 220, 1933, p. 78, 1935, p. 228); non LINNAEUS Sp. pl. ed. I (1753), p. 337, nec Syst. nat. ed. X, 2 (1759), p. 990, et aut. sequ. plur. Fig. 2 b—d.

Folia obtusa, late ovata, basi truncata vel subcordata. *Pedicelli* in quaque ochrearum axilla semper singuli. *Flores* in apice pedicellorum vulgo bini (vel in summa tantum parte inflorescentiae rarissime solitarii), secundarius quam primarius sat conspicue usque multo maior. *Valvae* florum geminatorum inaequales, maiores cuiusque floris sub-orbiculares usque quadrato-orbiculares, maxima floris primarii 7—11 mm longa, 7—11 mm lata, apice plus minusve profunde emarginatae, subplanae vel (minores) extus concavae usque plus minusve extrorsum longitudinaliter complicatae, rosaceae, venis anastomosantibus roseis, primariis plus minusve validis, modice reticulatae, margine nervo valido intense roseo spinuloso-dentato munitae, callo parvo triangulari-elongato praeditae, valva tertia cuiusque floris (florem alterum attingens) parva ecallosa; valvae florum solitariorum magis aequales, praeterea valvis maioribus florum germinatorum similes. *Nux* griseo-brunnea, floris primarii 3—4 mm longa, secundarii 2.5—3.5 mm longa, utraque lateribus exterioribus convexiusculis, latere interiore plano, omnibus ovato-lanceolatis, angulis acutissimis superne anguste alatis.

Sahara centralis et in monte Anti-Atlante Regni Maroccani (Typus ex Anti-Atlante MAIRE s. num.: Herb. Alger, fragm. etiam in Herb. S).

Rumex cyprius MURB. ssp. *vesceritensis* (MURB.) SAM.

SAM. l.c., 520.

Syn. *R. vesceritensis* MURBECK (1907, p. 18). Fig. 2 e, f.

Folia obtusa, ovato-rotundata usque ovato-oblonga, basi ovato-cuneata. *Pedicelli* in quaque ochrearum axilla bini usque quaterni. *Flores* in singulis pedicellis semper solitarii. *Valvae* subaequales, transverse elliptico-rotundatae vel rotundato-reniformes, 4—9 mm longae, 6—10 mm latae, planae vel extus leviter concavae, nunquam extrorsum longitudinaliter complicatae, apice emarginatae, basi truncatae vel latissime cordatae, vulgo plus minusve rosaceae, venis modice anastomosantibus

laxiuscule reticulatae, margine nervo valido laciniato-denticulato munitae, omnes basi callo parvo triangulari-rotundato praeditae. Nux griseo-brunnea, 3—3.7 mm longa, lateribus omnibus aequilatis convexiusculis lanceolatis, angulis acutissimis vix alatis.

Sahara algeriensis: Biskra (BALANSA, CHEREDIER)

R. cypricus ssp. *vesceritensis* var. *geminatus* SAM., l.c. 521.

Syn. *R. roseus* L. var. *hispidivalvis* MAIRE in sched. — SAM. l.c. Fig. 2 g.

A forma primaria subspeciei pedicellis in quaque ochrearum axilla semper singulis, floribus in apice pedicellorum binis, valvis inaequalibus papilloso-scabris, maximis 7—9 mm longis, 7—10 mm latis, duabus tantum cuiusque floris callosis et caryopside lateribus exterioribus convexiusculis, latere interiore plano tantum differt.

Montes Tassili-n-Ajjer Saharae centralis, ad Ariheret in lapidosis arenaceis, 900 m s.m. (MAIRE n. 1123: Herb. Alger et S).

The group of *R. vesicarius* and its allies has been treated exhaustibly by MURBECK (1907) and by SAMUELSSON (1939). I have nothing to add to the later treatment and I refer for details of geographical distribution to the papers cited.

23. *Rumex bipinnatus* L. FIL.

L. FIL. in Suppl. sp. pl. 211 (1781); SAMUELSSON, Ber. Schweiz. Bot. Ges. 42: 774 (1933).

Syn. *R. lacerus* BALB. var. *bipinnatus* MEISN. ap. DC. Prodr. 14: 69 (1836).

R. pictus FORSK. var. *bipinnatus* MAIRE, Bull. Soc. d'Hist. Nat. de Afr. Nord 20: 35 (1929).

Radix annua verticalis tenuis. Planta omnino glaberrima pluricaulis. *Caules* diffusi, arcuato-ascendentes vel suberecti, 15—55 cm longi, ± crasse fistulosi ad 6 mm crassi, internodiis mediis 3—5 cm longis, saepe a basi, rarius tantum in parte superiore iteratim ramosi, in ramos tenues erecto- vel arcuato-patentes aphyllis floriferos abeuntes. *Folia omnia* in vivo carnosula, in sicco tenuiter membranacea, praeter costam medianam subnervia, basalia et caulina inferiora petiolo latiusculo 1—4 cm longo suffulta; lamina ad summum 4 cm longa, plerumque brevior, ± 2 cm lata, ambitu ovata vel oblonga vel subcordato-triangularis, saepius omnino pinnatisecta, lobis crenulatis vel saepe bifidis, laciniis linearibus obtusis, interdum in lacinulos subfiliformes dissolutis, lobo terminali maiore ± crenulato, sinubus obtusis; raro lamina in foliis basalibus sublyrata, lobo terminali ovato lobis basalibus utrin-

que 1—2 ovato-lanceolatis crenulatis; folia superiora decrescentia brevius petiolata minus divisa magis elongata; folia summa plerumque anguste lanceolata integra. *Ochreae* tenuiter membranaceae maiusculae, floriferae e basi amplexicauli ovatae longe acuminatae. *Pedicelli* in axillis ochrearum 3—4-ni, tenuiter filiformes, atropurpurei, prope medium tenuiter sed distincte articulati, longitudine variabiles sed perigonio fructifero saepius breviores. Perigonium floriferum 1.7—2.5 mm longum, fructiferum mox deciduum, *foliola exteriora* vix 1.5 mm longa, obovata, demum reflexa pallida, tenuiter membranacea. *Valvae* fructiferae 6—7 mm longae, 7—8 mm latae, subaequales, e basi cordata suborbiculares, subplanae, tenuiter membranaceae, omnino vel imprimis marginem versus atropurpurascens, nervis tenuibus radiantibus parce ramosis vix anastomosantibus, nervo medio in valvis omnibus longitudinaliter anguste fusiformi-incrassato. *Nux* matura 2.7—3 mm longa, 1 mm lata, rufescens.

Morocco.

Umgebung von Mogador (J. BALL s.n., B; J. D. HOOKER s.n., K; G. MAW s.n., K; Hb. DRIVES s.n., AL; WATIER s.n., AL; MAIRE s.n., AL, S; H. LINDBERG 1925, LD, S; SAMUELSSON 6394, S, LD); Umgebung von Mogador, Oud el Ksab (WALL s.n., S); Ksya (BEAUMIER in Hb. Cosson s.n., G, G (Hb. Boiss.), K); Assaka (BEAUMIER s.n., G, K); Oudjan (BEAUMIER s.n., G, K); Dar Oula Delinu (BEAUMIER s.n., G, K); Oud Debeny (BEAUMIER s.n., G (Hb. Boiss.)); Aine Diab (J. J. PITARD 1497, K); Sous, greves de L'Oued Massa (R. MAIER s.n., AL); Dunes près de l'embouchure de l'Oued Sous (R. MAIRE s.n., AL); Haha, sables sur la rive droite de L'Acif—n. Ait-Amer pres Dar Kaid Tumri (R. MAIRE s.n., AL); Magazan (R. MAIRE s.n., AL); Fedhala (A. W. TRETHERY 174, AL, K); Agadir (JAHANDIEZ 202, LD); ibidem, in arenosis (SAMUELSSON 6507, S); Chaounia, sables maritimes a Sidi abd er Rahmane près Casablanca (J. GATTEFOSSE s.n., S); Cap Ghir, in arenosis, 300 m (SAMUELSSON 6467, S; MAIRE s.n., S); Tigert prope Cap Ghir (A. UGGLA s.n., S).

Tunis.

Gabes, sable près de la mer (J. A. BATTANDIER s.n., AL).

SAMUELSSON l.c. has carefully studied and discussed the systematic position of this species and its differences from its allies. *R. bipinnatus* is closely related to *R. pictus* but has characters of obvious specific value in its more dissected and usually bipinnate leaves, its smaller more orbicular valves much more intensely tinged with purple, the midrib of which is slightly thickened into a sort of very narrow fusiform callosity, and in its nut which is nearly always three times as long as wide. The geographic ranges of the two species are entirely

different, *R. bipinnatus* growing in limited areas in western Morocco and Tunis, *R. pictus* in Egypt, Palestine, and a few localities in Transjordan. Both species are confined to sandy soil, preferably on sea shores.

24. *Rumex pictus* FORSK.

FORSK. in Fl. aegypt.-arab. 77 (1775); SAMUELSSON, Ber. Schweiz. Bot. Ges. 42: 772 (1933).

Syn.: *R. lacerus* BALBIS, Miscell. botan. (Mem. de l'Acad. de Turin 7): 19 (1804—06).

Radix annua verticalis tenuis. *Caules* plures usque numerosi, decumbentes vel arcuato-ascendentes rarius suberecti, 5—50 cm longi, fistulosi, internodiis mediis 4—6 cm longis, saepe iam a basi ramosi, ramis in inflorescentias breves aphyllas sublaxas 2—10(—15) cm longas abeuntibus. *Folia* in vivo omnia carnosula, in sicco tenuiter membranacea, praeter costam medianam tenuem subnervia, basalia et caulina inferiora petiolo latiusculo 1—4 cm longo suffulta; lamina ad summum ad 4 cm longa vulgo brevior, ambitu ovata vel oblonga vel subtriangularis, raro subintegra, saepius pinnatipartita vel pinnatifida, lobis integris vel raro lobulo uno alterove auctis, ovato-triangularibus vel oblongis vel linearibus, apice rotundatis; lobo terminali maiori subintegro vel crenulato, sinibus obtusis. *Folia* summa brevius petiolata usque subsessilia, lineari-lanceolata, subintegra, apicem versus longe attenuata. *Ochreae* tenuiter membranaceae maiusculae, floriferae e basi amplexicauli ovatae, longe acuminatae. *Pedicelli* in ochrearum axillis 4—5-ni, tenuiter filiformes atropurpurei, prope medium tenuiter distincte articulati, perigonium plerumque subaequantes. Perigonium floriferum 1.5—2 mm longum, fructiferum mox deciduum. *Perigonii foliola exteriora* obovata demum reflexa, 1.5(—2) mm longa. *Valvae* fructiferae 7.5—9(—10) mm longae, (5—)6(—7.5) mm latae, subaequales, ambitu reniformes, tenuiter membranaceae, nervis atropurpureis radiantibus vix ramulosis parce anastomosantibus, omnes callum crassum ovoideum antice rotundatum partem centram valvae occupantem ferentes. *Nux* 2.2—2.5 (raro ad 2.8) mm longa, 0.9—1.2 mm lata, rufescens.

Distr.geogr.: Aegyptus, Palaestina, Transjordan.

Egypt.

Alexandria (MARTIUS s.n., G; I. PFUND s.n., C, B; LETOURNEUX s.n., B; MUSCHLER s.n., K; SAMARITANI 2995, W, B, G, G (Hb. Boiss.), S. JE; GAILLARDOT 467, B, JE; CADET DE FONTENAY s.n., B; GRUNOW s.n., W); (DELILE s.n., W); Alexandria, Ramleh (ASCHEPSON 1274, W; GAILLARDOT 60, JE; idem 120,

JE; O. SCHNEIDER s.n., B; J. M. HILDEBRANDT 7, B; ASCHERSON 2168, B; J. BALL s.n., K; LETOURNEUX s.n., LD, C; SICKENBERG s.n., Z; W. BARBEY 779, B, G, G (Hb. Boiss.); POST s.n., BEI; E. PEYRON s.n., G; O. BLANDENIER 427, G; G. F. SCOTT-ELLIOT 3608, K); Siuf bei Alexandria (ASCHERSON 1275, W, S); Mandara bei Alexandria (G. SCHWEINFURTH s.n., B); St. Stephano bei Alexandria (KUEGLER s.n., B, JE); Abou-Kir (PETRY 30, JE); Umgebung von Alexandria östlich bis Aboukir, westlich bis Mex (K. R. BLUMENKRON 24, W, WU); Mariut-Bringhi (R. MUSCHLER s.n., K); Rosetta (G. TÄCKHOLM s.n., S; SCHWEINFURTH 574, B, K, W; ASCHERSON 1277, B; ASCHERSON s.n., LD; R. MUSCHLER s.n., K); Desert de Salehieh a Peluse Pacho (coll. unkn., B); Damietta (G. EHRENBERG s.n., B, G (Hb. Boiss.), LD, C, K, W; SIEBER s.n., B, G (Hb. Boiss.), JE, LD, W; G. SCHWEINFURTH s.n., B); El Arish (A. EIG & ZOHANY s.n., Jerusalem); ohne angegebenen Fundort (FORSKÅL s.n., C, Typus; DELISLE s.n., G, W; OLIVIER s.n., B; FRAUENFELD s.n., W).

»Aegyptus inferior» (KOTSCHY 614, W).

As for the differences from *R. bipinnatus* L. see under this species.

Subgenus III. *Lapathum*.

(CAMPD. 1819; MEISN. 1856 pro sectione) RECH. F. 1937: 6.

Flores omnes vel plurimi androgyni. Perigonii foliola interiora (valvae) fructificationis tempore nuce pluries maiora, ecallosa vel callifera, integra vel vario modo dentata. Basis foliorum basalium et cauliorum inferiorum cuneata vel rotundata vel cordata, numquam hastata vel sagittata.

Clavis specierum.¹

- | | |
|--|----------------------------|
| 1 a) Caules ex axillis foliorum caulinarum ramos foliatis serius florentes emittentes (Sect. <i>Axillares</i>) | 2 |
| 1 b) Caules ramis axillaribus nullis | 6 |
| 2 a) Valvae ecallosae. Pedicelli quam valvae usque duplo longiores. Planta elata 1—2.5 m alta foliis amplis tenuibus | <i>R. ruwenzoriensis</i> . |
| 2 b) Valvae calliferae. Pedicelli breviores. Plantae humiliores | 3 |
| 3 a) Valvae denticulatae | <i>R. rhodesius</i> |
| 3 b) Valvae integrae | 4 |
| 4 a) Folia latitudine sesquialongiora, subovata | <i>R. cuneifolius</i> |
| 4 b) Folia latitudine 4—6-plo longiora, lanceolata | 5 |
| 5 a) Valvae 3.5—4.5 × (2—)3.5 mm. Folia 6 : 1 | <i>R. lanceolatus</i> |
| 5 b) Valvae maiores. Folia 4—5 : 1 | <i>R. spathulatus</i> |
| 6 a) Plantae perennes (conf. <i>R. bucephalophorus</i> ssp. <i>fruticescens</i>) | 7 |
| 6 b) Plantae annuae (vel biennes: <i>R. paluster</i>) | 19 |

¹ See foot note on page 11.

- 7 a) Valvae ecallosae, nervus medianus longitudinaliter interdum subincrassatus (si valvae hamato-dentatae conf. *R. Bequaertii*) 8
- 7 b) Valvae calliferae 9
- 8 a) Panicula compacta. Valvae suborbiculari- vel elongato-triangulares ad 6 mm longae, 4 mm latae, margine irregulariter minutissime pluridenticulatae. *R. azoricus*
- 8 b) Panicula aperta. Valvae irregulariter evolutae acutae vel acuminatae 4—5 mm longae, ad 4 mm latae, prope basin irregulariter sinuato- vel eroso-denticulatae *R. Caldeirarum*
- 9 a) Valvae integrae vel indistincte vel minute denticulatae 10
- 9 b) Valvae distincte saepe longe dentatae 15
- 10 a) Pedicelli quam valvae aequilongi vel saepius sesqui- usque duplo longiores. Calli quam valvae multo minores. Folia latitudine plus quam triplo saepe pluries longiora 11
- 10 b) Pedicelli quam valvae breviores usque aequantes. Calli maximam partem valvae occupantes. Folia longitudine triplo longiora 14
- 11 a) Folia latitudine 4—30-plo longiora 12
- 11 b) Folia latitudine ad summum triplo longiora *R. Gtnii*
- 12 a) Folia basi cuneata, latitudine 4(—6)-plo longiora. Valvae integrae. *R. crispus*
- 12 b) Folia basi distincte cordata, latitudine 10—30-plo longiora 13
- 13 a) Valvae integrae, unica plerumque callifera. Pedicelli valvis usque triplo longiores. Nux 3—3.5 mm longa, late fusiformis. *R. algeriensis*
- 13 b) Valvae minute regulariter denticulatae, omnes calliferae. Pedicelli valvas aequantes vel eis sublongiores. Nux 2.7—3 mm longa, late ovata. *R. tunetanus*
- 14 a) Florum glomeruli plerumque omnes foliati. Pedicelli valvas \pm aequantes. Calli valvas non omnino occupantes *R. conglomeratus*
- 14 b) Florum glomeruli superiores aphylli. Pedicelli quam valvae subbreviores. Calli valvas omnino occupantes *R. brachypodus*
- 15 a) Dentes valvarum apice recti 16
- 15 b) Dentes valvarum apice hamati 17
- 16 a) Planta 60—120 cm alta. Folia maiuscula tenuia. Pedicelli tenues quam valvae usque 2¹/₂-plo longiores *R. obtusifolius* ssp. *agrestis*
- 16 b) Planta 30—60 cm alta. Folia parva crassiuscula. Pedicelli crassi quam valvae breviores usque eas aequantes *R. pulcher*
- 17 a) Folia latitudine duplo longiora basi semper cordata. Valvae \pm 6 mm longae ovato-triangulares *R. nepalensis*
- 17 b) Folia latitudine 3—8-plo longiora basi plerumque cuneata vel truncata. Valvae minores 18
- 18 a) Folia latitudine 3—5-plo longiora. Valvae 5 mm longae oblongo-triangulares. *R. Steudelii*
- 18 b) Folia latitudine \pm 7—8-plo longiora. Valvae 3—4(—4.5) mm longae ambitu anguste triangulares *R. Bequaertii*

- 19 a) Flores in ochrearum axillis 1—4-ni, saepe dimorphi, pedicellis partim brevissimis partim elongatis clavatis. Folia basalia minuta, saepe spathulata. Planta regionis mediterraneae *R. bucephalophorus*
- 19 b) Flores numerosi glomerati 20
- 20 a) Valvae apice longe setaceo-attenuatae, unica plerumque tantum callifera. Dentes valvarum latitudine valvae usque 4-plo longiores 21
- 20 b) Valvae apice attenuatae acutae vel obtusiusculae, nunquam setaceo-attenuatae, omnes plerumque calliferae. Dentes valvarum breviores, interdum (*dentatus* ssp. *callosissimus*) omnino reductae 22
- 21 a) Folia latitudine 5—6-plo longiora. Rami fructiferi compacti columnares. Planta fructifera valida, rubescens *R. aegyptiacus*
- 21 b) Folia latitudine ca. 3-plo longiora. Glomeruli fructiferi omnes remoti. Planta gracilis *R. garipensis*
- 22 a) Folia latitudine ca. 2—3-plo longiora. Valvae 3.5—5 mm longae, dentibus validis, rarius valvae integrae *R. dentatus*
- 22 b) Folia latitudine 6-plo longiora. Valvae 1.8—2 mm longae, dentibus tenuibus. *R. palustris*

Sect. A. Axillares.

RECH. FIL. in Field Mus. Bot. 17/1: 6 (1937).

Perennes. Caules ex axillis foliorum infra inflorescentiam primariam ramos foliosos serius elongatos et florentes proferentes. Rami inflorescentiae plerumque singuli. Valvae ecallosae vel calliferae, in plurimis speciebus integrae. Folia in plurimis plana, basi plerumque cuneata.

25. *Rumex ruwenzoriensis* CHIOV.

CHIOV. in Bull. Soc. Bot. Ital. 1917: 56 (1917); Syn. *R. afromontanus* TH. FR. JR., Notizbl. Bot. Gart. Berlin 9: 35 (1924), syn. nov.

Perennis. *Caulis* 1 m altus (ex autore, 7—8 ft. sec. TOTHILL), erectus, subflexuosus, sulcatus, glaber, infra inflorescentiam ex axillis foliorum ramos foliosos, tempore florendi inflorescentiae primariae steriles sed ut videtur serius floriferos emittens. *Ochreae* pallide brunneae magne caducae. *Folia omnia* consistentia in sicco papyracea plana sed in extremo margine eroso-crispata, in statu juvenili revoluta, supra glabra, subtus ad nervos minute papillosa. *Folia infima* (basalia?, ex autore) oblongo-ovata, 30—45 cm longa, 10—12 cm lata, basi cordata, apice acuta, nervis secundariis numerosissimis a costa mediana angulo recto abeuntibus suberectis paulum tantum arcuatis; petiolus dimidiam longitudinem laminae superans. *Folia caulina* media ellipitico- vel ovato-lanceolata, basi rotundata vel angustata rarius subcordata, apice \pm longe acuminata, infra medium plerumque latissima, latitudine circiter 3-plo

longiora, petiolus latitudinem laminae aequans; folia caulina superiora sensim minora, brevius petiolata, longius acuminata. Rami inflorescentiae singuli simplices, inferiores tantum folio suffulti, paniculam parvam subapertam formantes. *Florum glomeruli* multiflori inferiores remoti, superiores approximati, foliis non suffulti. *Pedicelli* fructiferi validiusculi, in medio vel supra rarius infra indistincte articulati, longitudine variabiles, perigonio maturo dimidio breviores usque fere duplo longiores, basin perigonii versus subito incrassati. *Perigonii foliola exteriora* lineari-lanceolata, marginibus interiorum arcte appressa, 2,5—3 mm longa, acuta. *Valvae* ovato-lanceolatae, 4—4.5 mm longae, 2.5 mm latae, apice obtusiusculae, margine integrae facie indistincte nervosae, nervus medianus ceteris validior sed non callifer. Antherae 2 mm longae. *Nux* fusca, nitida, 2.3 mm longa, 1.8 mm lata.

Kenya.

In declivibus occidentalibus montis Kenia prope Forest Station, in silva montana ad rivulum, 2350 m (R. E. & TH. C. E. FRIES 651, 651 a, Type of *R. afromontanus* TH. FR. JR., Br, S, UPS, W). Western slopes of Mt. Kenia, along trail from West Kenia Forest Station to summit, at about 3630 m, in the giant heath zone (E. A. MEARNs, 1466, 1478, 1685, BM, Br, US). Northwestern slopes of Mt. Kenia (P. M. SYNGE 1774, BM). From the Katheroni River (1800 m) and the Kasarougai River (1950 m) to West Kenia Forest Station (2250 m), Mt. Kenia (E. A. MEARNs 1268, US). Mt. Elgon, 3900 m (LUGARD 428, K). Limuru, 2300 m (R. A. DÜMMER 1638, BM, K). Aberdare Mts (EVAN JAMES, K).

Tanganyika.

Lukwangule, Uluguru-Mts., 2700 m in marshy bottom on the grassy plateau (MICHELMORE 898, K). Morogoro, Uluguru-Gebirge, Westseite, Lukwangule-Hochland, Gebirgssavanne über dem Nebelwald, 2400 m, Sumpfstelle, 1 m hohes Kraut, teils im Wasser (H. J. SCHLIEBEN 3514, B, BM, Br, P, S).

Uganda.

Ruwenzori, Bujuku valley, 3200 m (EGGELING 1295, 1298, K). Mt. Elgon, Bulambuli, 3000 m (SAUNDY & HANCOCK 58, K). Mt. Elgon, Bulambuli, Bugishu, 3000 m, rough grass, bamboo zone, frequent, high 5 ft., large swollen stem, procumbent at base, rooting at nodes, leaves with large midrib, crimson above, stamens yellow, stigmas pink (A. S. THOMAS 565, K). Mt. Elgon, above Bulambuli, 3200 m, bamboo zone, branching tough herb, 7—8 ft., leaves concave-lanceolate (TOTHILL 2353, K). Mt. Elgon, Bulambuli, 3200 m in marshy ground near stream, ht. 3—4 ft., stem red (P. M. SYNGE, BM). Mt. Elgon, heath zone, swampy localities, 3700 m (DÜMMER 3466, K). — Uganda, sul Ruwenzori nella valle Mobuku scendendo da Nabitava a Bi-

hunga. 9.VII.1906, fl. e fr. giovani; (SAVOIA s.n., TO, Type of *R. ruwenzoriensis* CHIOV.); nella valle Mobuku a Kichuchu, 7.VII.1906, fl. et fr. giovani (SAVOIA s.n., TO, Syntype of *R. ruwenzoriensis* CHIOV. non vidi!). From upper edge of bamboo zone (LIEBENBERG 1639, K).

Belgian Congo.

Volcan Mikeno, Kivu, 3000—3400 m (HUMBERT 8042, Br; CHAPIN 398, NY). Kalora (Mikeno), alt. 3200 m (DE WITTE 1752, Br). Mikeno Vulcano, Pass between Mikeno et Karisimbi, herb to 4 ft. high, 3000 m, local in the margin of *Hagenia* forest among *Umbelliferae* (BURTT 3041, K). Montagnes a l'ouest du Lac Kivu, chemins près de Ishibinda, vers 2000 m (HUMBERT 7374, Br). North-slope of Mt. Karisimbi, Kivu distr., 4000 m. This sorrel is one of the most characteristic herbs in the *Hagenia*-forest (CHAPIN 325, Br, NY). Ruwenzori (Lanuri), 3000 m (BEQUAERT 4682, Br). Camp Kabara, Southern slope of Mt. Mikeno, 10615 ft. (H. LINDER 2388 a, K).

This species has usually been known under the name *R. afromontanus* FRIES. The type specimen of *R. ruwenzoriensis* in Hb. Turin agrees perfectly well with that of *R. afromontanus* and so the earlier name has to be accepted.

R. ruwenzoriensis has been compared by its author with *R. obtusifolius* and *R. linearis*, and *R. afromontanus* with *R. nepalensis*. The species is indeed rather isolated. It, as well as *R. lanceolatus* (= *linearis*), belongs to the Sect. *Axillares*, which has its center of distribution in the New World.

26. *Rumex cuneifolius* CAMPD.

CAMPD., Monogr. *Rumex* 95 (1819); RECH. F. Arkiv för Botanik 26 A, No. 3 (1933). *R. frutescens* DU PETIT-THOUARS, Esquisse Fl. Tristan d'Acougne in Mélanges Bot. et Voy. 4: 38 (1811); MEISN. ap. DC. Prodr. 14: 72 (1856), syn. nov.

Rhizoma lignosum articulatum longe repens ramosum, caudices steriles folia tantum gerentia et caules floriferos emittens. *Caules* floriferi 15—40 cm alti, crassi arcuato-ascendentes vel suberecti, internodiis mediis 4—6 cm longis, foliosi, in axillis foliorum inferiorum saepe fasciculos foliorum serius evidenter in ramos axillares elongatos gerentes. *Ochreae* magnae membranaceae pallide brunneae, caducae. *Folia caudicum sterilium* breviter petiolata, petioli crassi, quartam (raro dimidiam) circiter partem laminae longitudinis attingentia, in sicco crasse coriaceo-membranacea, basi evidenter cordata, apice rotundata, ambitu elliptica, plana, extremo margine autem subcrispato-crenulata, latitudine ca. sesquialongiora, ad summum 7 cm longa, utrinque glabra et laevia; nervi laterales angulo $\pm 45^\circ$ a mediano abeuntes, utrinque 8—10. *Folia cau-*

lina obovata vel obovato-oblonga, consistentia ac nervatura rosularibus similia sed proportione longiora, supra medium saepe latissima, longius petiolata, basi \pm truncata, apice interdum acutiuscula, extremo margine distinctius crenulato-crispata. *Folia ramos inflorescentiae fulcrantia* breviter petiolata, utrinque angustata, latitudine ca. 3-plo longiora. *Inflorescentia* pauciramosa, rami breves erecti, plerumque singuli simplices aphylli. *Florum glomeruli* multiflori, infimis exceptis contigui. *Pedicelli* fructiferi quam valvae breviores, validi, prope basin articulati, in perigonium sensim dilatati. *Perigonii foliola exteriora* ca. 1,5 mm longa, basibus interiorum appressa. *Valvae* fructiferae \pm 4 mm longae, \pm 3 mm latae, ovato-triangulares, integrae, apice subacutae, consistentia crasse coriaceae, grosse sed interdum indistincte reticulato-nervosae, omnes callum ovato-fusiforem aurantiacum tenuiter impresso-punctatum ferentes. *Nux* \pm 2,5 mm longa, \pm 2 mm lata, in medio circiter latissima, fusca.

Distr. geogr.: America australis; in Americam borealem et Europeam raro introductus.

Tristan de Cunha.

Near sea shore and near stream of settlement, 10—60 ft. (DYER 3518, K. NH). Big Beach, on sand (E. CHRISTOPHERSEN 14, S). Carmichal (K). »Tristan da Cunha« (MOSELEY, Challenger Exp., s.n., BM, E).

Gough Island.

Gough Island (R. M. RUDMORE BROWN, Scotch Nat. Antarctic Exped., s.n., E).

The above description has been drawn from specimens from Tristan da Cunha. On closer examination I can find no distinctive characters between *R. frutescens* and *R. cuneifolius*, the latter of which is rather polymorphic as to leaves and fruits (see RECH. F. 1933). So the former must be cancelled from the list of endemics of that distant island situated at about 39° S and 12° W in the midst of the South Atlantic between South Africa and South America. I do not dare to answer the question definitely as to whether *R. cuneifolius* is indigenous on that island and thus is to be counted as an additional South American element or whether it has been introduced by man. In this connection the occurrence of *R. cuneifolius* in England may be mentioned. The plant is well established on dunes in South England. LOUSLEY, Report Bot. Exch. Club 1941—42: 579 (1942) has discussed the possibility of the introduction of *R. cuneifolius* into England by means of ocean

currents. The buoyancy of the fruit is great and so *R. cuneifolius*, which grows in South America on the sea shore as well as in the high mountains, might have been introduced to Tristan da Cunha by this mean.

27. *Rumex lanceolatus* THBG.

THBG., Prodr. Pl. Cap. 1: 67 (1794), Fl. Capensis 340 (1807—1813); CAMPD. Mon. Rum. 148 (1819); MEISN. ap. DC. Prodr. 14: 50 (1856), emend. RECH. FIL. Syn. *R. linearis* CAMPD. Mon. Rum. 90 (1819); MEISN. ap. DC. Prodr. 14: 50 (1856); WRIGHT Fl. Capens. 5/1: 479 (1912), *synon. nov.*

R. Ecklonianus MEISN., Linnaea 14: 493 (1840); WRIGHT in Fl. Capens. 5/1: 477 (1912), *synon. nov.*

R. Meyeri MEISN., Linnaea 14: 494 (1840), *synon. nov.*

R. Ecklonii MEISN. ap. DC. Prodr. 14: 50 (1856), *synon. nov.*

R. Meyerianus MEISN. ap. DC. Prodr. 14: 50 (1856), *synon. nov.*

R. Hydrolapathum (non HUDS.) WRIGHT in Fl. Capens. 5/1: 477 (1912).

Caulis (15—) 20—35 (—50) cm longus, arcuato-ascendens, sat grosse canaliculatus, ex internodiis omnibus surculos foliosos serius florentes emittens. *Folia caulina* in sicco crassiuscula (in vivo ut videtur subcarnosa), lamina anguste lanceolata, ad 12 (—18) cm longa, ad 2 (—3) cm lata, plana vel paulum undulata, basi apiceque subaequaliter attenuata, nervis secundariis tenuibus saepe inconspicuis angulo 45—60° a mediano abeuntibus; lamina in medio vel paulo supra latissima; petiolus ad 3(—5) cm longus. *Inflorescentia* parva, paniculam e ramis brevibus arcuato-erectis vel paulo divergentibus plerumque singulis simplicibus composita. *Glomeruli* multiflori aphylli, omnes vel superiores quidem approximati. *Pedicelli* inaequilongi, perigonio maturo breviores, aequilongi usque paulo longiores, saepe supra medium vel prope basin perigonii articulati, basin perigonii versus dilatati. *Perigonii foliola exteriora* lanceolata carinata, basibus valvarum arcte appressa, \pm 2 mm longa. *Valvae* fructiferae (3,5—) 4 (—4,5) mm longae, (2—) 3,5 mm latae, ambitu lingulatae vel rhombicae vel fere triangulares, apice acutae, margine integrae vel subdenticulatae, consistentia cresse membranaceae vel subcoriaceae, colore pallide brunneo, nervatura crassiuscula subirregularis non semper distincte reticulata sed saepe foveolato-cristata; valvae omnes calliferae; calli fusiformes, ca $\frac{2}{3}$ vel $\frac{3}{4}$ longitudinis valvae attingentes, apice acutae sensim in nervum medianum valvae transientes, aurantiaco-brunnei, laeves vel subrugulosi. *Nux* matura (2—) 2,2 (—2,5) mm longa, 1,2(—1,5) mm lata, infra medium latissima, atrobrunnea.



Fig. 6. *Rumex lanceolatus*
THBG. Typus.

Transvaal.

Near Christiana along ditches (J. BURTT-DAVY 1618,¹ K). Coalbrook, in water (GILMORE 2121, PRE). Ermelo, Farm Nooitgedacht (HENRICI 1138,¹ PRE). Ludlowfarm, Springbok Flats (J. BURTT-DAVY 2503,¹ K, PRE). Stadt Lydenburg (WILMS 1278, BM). Dougo a few miles S of Middelburg (ACOCKS 5568, S). Platrand (ROGERS 630, GRA). Potchefstroom, Dassiesrand (WESTHUIZEN 893, PRE); Buffeldoorns-Potchefstroom-Distr. (LOUW 1103,¹ PRE). Pretoria, Berea Park (LEENDERTZ 394,¹ GRA, K (sub *R. hydrolapathum*)). Belfast, Farm Rietvalei (J. BURTT-DAVY 1250, K). Rustenburg, 1500 m (NATION 263,¹ K). Standerton, along vlei and on town street higher up (J. BURTT-DAVY 903, K). Witwatersrand (MOSS 16786, BM). Wolmaranstad, Boskuil, 1400 m (SUTTON 136,¹ PRE); Near Wolmaranstad (J. BURTT-DAVY 1526, K); Between Wolmaranstad and Klerksdorp (HUTCHINSON 2974, K, PRE).

¹ young specimens.

Natal.

Dargle Road, St. Ives (MOGG 5084,¹ 5684,¹ PRE). Meteor-Ridge, 1600 m, Mooi River (MOGG 7086, PRE). Estcourt (BROWN 134, NH; O. WEST 1576, NH). Kokstad (WOOD 4191, NH). Mahlabathini (G. GERSTNER 4235, NH). Upper Umhlatuzi (G. GERSTNER s.n., NH). Umlaat (SNOW 3175, NH). Weenen City., Brakfontein, near Frere, 1050 m (ACOCKS 10829, NH, PRE). Upper-Umlaat (WOOD 3161, K). Pietermaritzburg, 700 m, Alexandiapark (HUNTLEY 293, PRE). Durban, Berea (LANSDELL 1196,¹ PRE). Maritzburg (LANSDELL 873, K).

Basutoland.

Leribe, 1700—2000 m (DIETERLEN 111, NH, P; idem 7027, K). Mamathes (A. J. GUILLARMOD 2, NH). Zeyatyaneng-Distr., 2000 m (COLLETT 485,¹ PRE).

Orange Free State.

Bethlehem, 1650 m (PHILIPPS s.n.,¹ PRE). Bloemfontein, (POTTS 3286, PRE). Fauresmith, Farm Samar, 1550 m (SMITH 4631,¹ PRE). Kroonstad (PONT 501, PRE); 15 miles W of Bothaville, in dry veld near banks of Vaal River (SCHWEICKERDT 1078, PRE). Reg. Senekal, Doornkop (GOOSSENS 1050, PRE). Banks of Groot Vat Road near Brandfort, Road to Winburg (ACOCKS 8276,¹ S). Distr. Zastron, gardens, (MAREE 94, PRE). Vredefort, Leeuwspruit, Orange-River-Col. (BARRETT-HAMILTON s.n., BM).

Cape Province.

Albany (BOWER s.n., K); Distr. Albany, Somerset (ALEXANDER s.n., K); Alexandersfontein (POWER s.n.,¹ PRE). Benauwdheidfontein (MARLOTH 878, PRE). Barrydale (HAFSTRÖM s.n., ACOCKS 414,¹ S). Burghersdorp (ACOCKS 49,¹ GRA). Colesberg (SHAW s.n., K). Cap (WAHLBERG s.n.,¹ S); ibidem, 1350 m (BAUR 282,¹ GRA). De Aar (RAATH & DE VILLIERS s.n.,¹ PRE). Enon (THODE 2745, PRE). Graaff-Reinet (THORNTON 200,¹ K); ad vias prope Graaff-Reinet, 1300 m (BOLUS 431,¹ K, PRE, S). Grahamstown, in ruderatis (DYER s.n.,¹ GRA, PRE; MCOWAN 1410, K); ibidem, Fiddlers Green (SALISBURY s.n.,¹ GRA). Grootfontein, Middelburg (THERON 77,¹ PRE; VERDOORN 1524,¹ PRE, K). Howisons Poort (COOPER 3056,¹ K). Reg. Hay, Zoutpan (WILMAN 1911, KMG; Klein Papkuil (WILMAN s.n.,¹ PRE). Hutchinson Reg., 1350 m (ACOCKS 9611, PRE). Kaffraria (COOPER 362, BM). Tembuland, Bazija, 200 m (BAUR 282,¹ K). Karoo: 9 miles along Benkesfontein Road in dry river bed, Zoutpansdrift, 600—700 m (PEARSON 5003,¹ BM, GRA, K). Kentani, moist places round homesteads (PEGLER 1375,¹ PRE). King William's Town, Alice (MARITZ 12,¹ GRA). Klip Drift, Herbert Div. (MARAIS s.n.,¹ PRE). About farm homesteads etc., near Komgha (FLANAGAN 76, PRE). By the Kraai River, Aliwal North Div., 4500 ft. (DREGE s.n., K, *Cotypus R. Meyeri* MEISN.). Malmesbury, fields near Hopefield (Letty 140,¹ PRE). Matjesfontein, streamside (FOLEY 93,¹ PRE). Uitenhage (ALEXANDER s.n.,¹ K; ECKLON & ZEYHER, s.n.,¹ GRA; WARD 106, ZEYHER s.n., K); ibidem, Zwartkops River, valley and adjoining hills

¹ young specimens.

from Villa Paul Maré to Uitenhage (ECKLON & ZEYHER s.n.,¹ PRE). Queens-town, 1200 m (GALPIN 2237,¹ GRA). In litore maris dunisque ad Rietvalei, 35 m (ZEYHER & ECKLON s.n., P). Riversdale, 130 m (SCHLECHTER 1997,¹ BM, GRA, K, S). Stockenstroom, Katberg, moist places, 1350—1550 m (DYER 731, GRA). Stutterheim (ACOCKS 9031,¹ PRE); ibidem, Fort Cunynghame, along-side road through plantation, 1000 m (SCHONLAND 52, GRA). Uniondale, Haarlem, near river at railway bridge, 900 m (FOURCADE 2958, K). Willowvale, Gora River Mouth, near Mazeppa Bay (HILNER 417, PRE); Willowvale, Lara River Mouth, side of road, 2 miles from Lara, 35 m (HILNER 470, GRA). Zitzikama-Distr., Flats, Bitano-River, 10 m (FOURCADE 622, 995, GRA). — Am Graben bei Doornkop in der Bergschen Fläche (ECKLON s.n., S). Fairford, Cathcart (COCKERRELL 47, GRA). Lovedale (BENNIE 692, GRA). Rhinosterskop (DRÈGE s.n., NY, Lectotypus *R. Meyeri* MEISN.). Ad rivulos et in uliginosis Zoetendalsvalley, Zwelldam (KRAUSS 797, NY, Cotypus *R. Meyeri* MEISN.).

Brit. Betchuanaland.

Mochudi (HARBOR 6511, PRE; 6641, K, PRE). Rietfontein (POLE-EVANS 302, PRE).

Griqualand.

Reg. Barkly West, Pniel (ACOCKS 1585, 4153, KMG). Douglas, along the Vaal (MARLOTH 7206, PRE). Vaal-Bank (HAYGARTH 4191, K). Griquatown (BURCHELL s.n., K). Kimberley, Riverton (WILMAN 1912, KMG).

Bushmanland.

Kweekfontein, 1000 m, in clumps in sandy river bed (PEARSON 3790, BM, GRA, K, NH).

Little Namaqualand.

Brakrivier, 550 m, River bed (PEARSON 4865, BM, GRA, K). Kambies (PEARSON 3464,¹ K); Dry sandy river bed at Kambies (PEARSON 3952, K). Near the mouth of the Orange-River (DRÈGE s.n., K). 2 miles S of Tweefontein (PEARSON 3458, K).

South West Africa.

Swakopmund (PEARSON 536,¹ K). Swakop-River mouth (BRADFIELD 544, P). Vlei at Kubik, Keetmanhoop-Ababies-Windhoek (PEARSON 9493,¹ K). Kamiesberg, (ADAMSON 1461 A, PRE).

This is the plant usually treated under the name *Rumex Ecklonianus* MEISN. I was long puzzled by the fact that there was no name older than MEISNER's for this species evidently so frequent and so largely distributed throughout South Africa. Indeed, examination of THUNBERG's type specimens of *R. lanceolatus* and *R. spathulatus* in hb. Ups. proved at first

¹ young specimens.

glance to be extremely similar to each other as well as to *R. Ecklonianus*. Unfortunately I was not able to examine the type specimen of *R. linearis* CAMPD., but I suspect that this too may belong here. THUNBERG's type material of *R. spathulatus* consists of two sheets, one showing one and the other three specimens. There is also a third sheet in hb. St. of one specimen bearing the name of *R. spathulatus* in exactly the same handwriting as on the Upsala sheets. This sheet is very likely an isotype. Unfortunately none of the five specimens is in fruit. On closer examination they show certain differences. The specimens of *R. lanceolatus* are more slender, the panicle more branched, the leaves narrower (1 : 6—1 : 10), and the flowers, especially the inner perianth segments at anthesis, very small (1—1.5 mm). On the other hand, the sheet of *R. spathulatus* with the single specimen and marked with *R. spathulatus* »β» is as tall as the former but stouter, the panicle scarcely branched, the leaves broader (1 : 4—1 : 5), more reddish-brown (their margins sinuately erose by an insect) and the flowers much larger, the inner perianth segments up to 3.1 mm long at anthesis. The other labeled sheet of *R. spathulatus* »α» in the Upsala herb. contains one small specimen of the large-flowered type in the middle and two small-flowered specimens on the left and right. The latter two plants do not completely agree with the small-flowered *R. lanceolatus* as they are less tall and have broader and shorter leaves tinged with olive green. The Stockholm sheet belongs to the large-flowered type.

The original descriptions of both *Rumex lanceolatus* and *R. spathulatus* are very short and incomplete and refer neither to the more essential characters for placing the species in their natural systematic position — viz.: axillary branching, lack of true basal leaves — nor do they express the chief characters, by which THUNBERG's two species may be distinguished from each other — size of flower, etc. In spite of the type material being scarce and the diagnoses very short, there is no doubt that when searching for the oldest name for the plant usually called *R. Ecklonianus*, we have to consider first these two names of THUNBERG.

Revision of the material in most of the more important European and South African herbaria has shown that the group of *R. Ecklonianus* is very polymorphic. Nearly all the characters vary considerably: ascending or erect stem, more or less branched panicle, width of leaves, and even the fruit, which usually provides reliable characters in this genus, fluctuates, the size of valves varying from 3 to 4.5 mm and the outline

from rhombic-lingulate to lanceolate-triangular. As far as I can judge from dried material only, scarcely any of the characters are closely correlated to each other or confined to special regions. I was not able to draw sharp specific lines between most of the forms considered hitherto as species by most authors (MEISNER, WRIGHT, etc.), nor could I find sufficient support to give any of them subspecific rank. I am quite aware that this question should finally be answered by a resident of the area having an opportunity to investigate the plants in nature and cultivate them.

The specific separation of *R. spathulatus* from the rest of the forms proposed here is tentative and is based mainly on the extremely large size of the inner perianth segments at time of flowering. I found only a few specimens in the ample material at hand which agree with *R. spathulatus* in this new circumscription. In accepting the name *R. spathulatus* for these large-flowered forms, one must rely on the majority — 3 out of 5 — of the existing authentic specimens and exclude the two others.

I believe that *R. lanceolatus* has to be accepted as the oldest name for the polymorphic group previously known as *R. Ecklonianus*, including *R. linearis* CAMPD., *R. Meyeri* MEISN., etc. The type specimen of *R. lanceolatus* represents a tall and narrow-leaved form, as shown by ample comparative material, and unlike *R. spathulatus* is within the range of variation of the species in our broad sense.

The systematic position of *R. lanceolatus* THUNBG. emend. RECH. F. and its synonyms has not been much discussed before, so far as I know. This species has usually been compared with or inserted near one or the other of the species with entire valves and more or less similar leaf-shape. Nobody seems to have paid attention to the fundamental difference between *R. lanceolatus* and most of the other African and even Old World species, which lies in the habitual characters. *R. lanceolatus* clearly belongs to the large group of species characterized by producing regularly leafy axillary shoots which usually develop secondary inflorescences, the flowering and fruiting process therefore being practically unlimited. I have created the sectional name *Axillares* for all such species, when dealing with the North American species of *Rumex* (1937). In a later paper (1949) I have discussed the correlation of these morphologic characters with geographical distribution and without entering into details, mentioned the occurrence in Africa of species belonging to the sect. *Axillares*. I was referring specifically to *R. linearis*.

28. *Rumex spathulatus* THBG.

THBG., Prodr. Fl. Capens. 1: 67 (1794); Fl. Capens. 540 (1807—13); CAMPD., Mon. Rum. 71, 144 (1819); MEISN. ap. DC., Prodr. 14: 50 (1856); WRIGHT, Fl. Capens. 5/1: 480 (1912), emend. RECH. FIL.

Differt ab affini *R. lanceolato* THBG. perigonii segmentis interioribus jam in statu florendi manifeste majoribus, usque ultra 3 mm longis, fructiferis ultra 6 mm longis anguste lingulatis acutis. Planta verosimiliter elatior, validior.

Natal.

Bei Pietermaritzburg (F. WILMS 2245^c, K).

Transvaal.

Distr. Lydenburg, bei der Stadt Lydenburg (F. WILMS 1278, K).

Cape Province.

»Cap b. Spei» (THUNBERG, UPS, S, Typus); »In uliginosis planitie Capensis» (ECKLON & ZEYHER, PRE, S); Cape Flats (R. S. ADAMSON 1356, PRE); Cape Div., fresh water pond toward North Hook (MILNE 164, HERALD, K); Milnerton (A. HAFSTRÖM, S); Uitenhage, Zwartkopsrivier, Thal und angrenzende Hügel von Villa Paul Maré bis Uitenhage, 50—500 ft. (ECKLON & ZEYHER, S); Worcester, Winterhoeksberg, 1000—5000 ft. (ECKLON & ZEYHER, S); Wynberg Flats, in humidis (R. MARLOTH 7205, BM, PRE; WALLICH, K); Ditch near Kuils River station (J. P. H. ACOCK 575, S). Without locality (OLDENBURG 1090 sub *R. crenulatus*, BM).

For the discussion of this species see under *R. lanceolatus* THBG. (p. 66).

29. *Rumex rhodesius* RECH. F.

RECH. F. in Candollea 11: 230 (1948).

Perennis. *Caulis* ultra 60 cm altus, fistulosus, profunde sulcatus, virescens, irregulariter ramosus, ramis foliosis primum abbreviatis deinde elongatis verosimiliter fructificatione inflorescentiae primariae peracta floriferis. *Ochreae* hyalinae valde caducae. *Folia* omnia plana, in sicco tenuiter membranacea, glabra laevia, petiolata, petiolo ad 10 cm longo. *Lamina foliorum inferiorum* lanceolata, ad 25 cm longa, ad 5 cm lata, in medio circiter latissima, utrinque subaequaliter angustata, nervis secundariis 50—60^o a costa mediana abeuntibus. *Folia caulina superiora* et ramealia minora brevius petiolata. *Inflorescentia* ampla aperta, ramis infimis foliis suffultis exceptis aphylla. *Florum glomeruli* multiflori, plurimi remoti, summi tantum subcontigui. Perigoniorum fructiferorum *pedicelli* validi rigidiusculi, infra medium distincte articulati, longitudine valde variabiles, perigonio maturo ad summum duplo



Fig. 7. *Rumex spathulatus*
THBG. Typus.



Fig. 8. *Rumex rhodesius*
RECH. FIL. Typus.

longiores, basin perigonii versus incrassati. *Perigonii foliola exteriora* ad 2 mm longa, acutiuscula, basi interiorum appressa. *Valvae fructiferae* lingulato-triangulares, ad 4 mm longae, prope basin 2—2.5 mm latae, basi late cuneatae vel rotundatae rarius subtruncatae, apice \pm linguiformi-productae acutae, margine in dimidio inferiore dentibus brevibus acutis saepe \pm curvatis irregularibus $\frac{1}{2}$ mm longis provisae, consistentia crasse rigidule membranacea, facie grosse prominenter reticulato-nervosae subfoveolatae, omnes subaequaliter calliferae; calli laeves fusiformes brunneo-aurantiaci, latitudine plus quam duplo longiores. *Nux* matura 2.5 mm longa, 1.5 mm lata, infra medium latissima, basi breviter, apice longius acuminata. — Verosimiliter ad sectionem *Axillares* pertinet. Quoad valvas breviter non uncinatae dentatas quasi medium

tenet inter *R. lanceolatum* THBG. integrivalvem Africam australem inhabitantem et *R. nepalensi* species affines Africam tropicam incolas valvis longe uncinato-dentatis praeditas.

Southern Rhodesia.

Distr. Salisbury, 4800 ft., May 1919 (F. EYLES 1654, BM, PRE, Typus); Distr. Salisbury, Makabusi River, by river 4500 ft., (H. WILD 2010, BM, K, W); Distr. Mazoe, Citrus Estate (FORD 5356 BM); Distr. Bulawayo, Hillside, by stream 4500 ft., (H. WILD 350, K, W).

Transvaal.

P. P. Rust, N. Transvaal (J. A. ROGERS 1318, GRA). Near Johannesburg (MOSS 14623, BM).

Natal.

Durban, loco humido (R. & TH. FRIES 3186, UPS); Durban Berea (K. A. LANSDELL 1196, PRE); Sea View, 10—15 ft. (J. M. WOOD 12764, PRE); Near Umgeni mouth, 50 ft. (J. M. WOOD 4005, 6487, K, NH); Near Umgeni River (FORBES & OBERMEYER 61, NH).

When describing *R. rhodesius* I mentioned its intermediate position between *R. lanceolatus* (= *R. Ecklonianus*) and the Subsect. *Hamati* (*R. Steudelii*, *R. Bequaertii*, etc). After having seen more specimens of *R. rhodesius*, I came to the conclusion that this species might possibly be of hybrid origin in spite of its evident high fertility. This problem would be worth closer investigation by resident botanists.

WOOD No. 4005 differs from the type in having longer teeth on the valves and larger callosities.

Sect. B. Simplices.

RECH. FIL., 1937: 7.

Annui, biennes vel perennes. Caulis infra inflorescentiam non ramosus, nunquam ex axillis foliorum ramos foliosos serius elongatos et floriferos proferens. Rami inflorescentiae singuli vel fasciculati. Valvae fructiferae ecallosae vel calliferae, integrae vel vario modo dentatae.

Subsect. a. Aquatici.

RECH. FIL. in Fedde Repert. 31: 232 (1933) in nota.

Perennes. Folia inferiora basi saepe cordata, in plurimis speciebus infra medium latissima, latitudine normaliter plus quam triplo longiora. Valvae ecallosae, integrae.

30. *Rumex azoricus* RECH. F.

RECH. F. in Candollea 11: 229 (1948).

Radix ignota sed verosimiliter perennis. *Caulis* certe elatus (fragmentarie tantum notus) brunneo-purpurascens crasse fistulosus canaliculato-sulcatus, superne crebre iteratim ramosus ramis saepe fasciculatis verosimiliter paniculam sat amplam \pm compactam basi paucifoliatam formantibus. *Folia basalia* et caulina inferiora ignota. *Folia caulina superiora* ramos infimos inflorescentiae fulcrantia breviter crasse petiolata, petiolo laminae latitudine evidenter breviora, lamina e basi \pm late cuneata vel subtruncata oblongo-ovata acuta ampla ad 25 cm longa, ad 10 cm lata, glabra et laevis, subplana vel levissime undata, prope vel supra basin latissima, nervis lateralibus angulo $\pm 60^\circ$ a primario abeuntibus numerosis crebre arcuato- et reticulato-anastomosantibus; folia summa brevissime petiolata, basi anguste cuneata, in tertia parte inferiore latissima, apicem versus sensim angustata, apice acutissima, latitudine usque quadruplo longiora. *Florum glomeruli* fere omnes aphylli multiflori \pm contigui. *Pedicelli* fructiferi tenuiter filiformes flaccidi, prope basin tenuiter saepe indistincte articulati, basin perigonii versus paulo incrassati, longitudine sat variabiles, perigonio submaturo sesquiusque duplo longiores. *Perigonii foliola exteriora* ad 3 mm longa, linguari-linearia, dimidia latitudine valvarum fere semper longiora. *Valvae* (submaturae) suborbiculari- vel elongato-triangulares, tenuiter membranaceae, tenuissime nervosae, nervo mediano saepius aliquantum longitudinaliter incrassato, ad 6 mm longae, ad 4 mm latae, margine prope basin irregulariter minutissime pluridentatae vel interdum subcrenulatae rarius subintegrae. *Nux* (submatura) pallide brunnea, ad 3 mm longa, ad 2 mm lata, paulo infra medium latissima. — In affinitatem *R. aquatici* L. pertinet, cui forma foliorum et valvarum et callis deficientibus similis. Inter affines valvis acutissimis minute sed manifeste denticulatis insignis.

Azores.

Fayal, Crater. 1. May 1929 (WARBURG et TUTIN H. 489, Typus in Herb. Kew.).

R. azoricus is only known from one fragment without ripe fruits. But judging from the leaf outline and valves, which lack grains, it must be placed in the Subsect. *Aquatici*, thus forming one of the southernmost outliers of this essentially North Temperate group which is distributed in both the Old and New World (see RECH. F., Field Mus. Bot. 17 (1937) and Candollea 12 (1948). *R. azoricus* can be distinguished from the

other species of this subsection by the very acute denticulated valves. See also *R. Caldeirarum* WATS. ex MEISN. = probably *R. azoricus* × *obtusifolius* ssp. *agrestis*.

31. *Rumex Caldeirarum* (WATS. ex DC. pro syn. *R. aquatici*)
RECH. F.

RECH. F. in Candollea 11: 235 (1948); probably = *R. azoricus* × *obtusifolius* ssp. *agrestis*.

Verosimiliter perennis. *Caulis* erectus elatus, crasse fistulosus, purpureo-brunneus, tenuiter sulcato-striatus, infra inflorescentiam non ramosus. *Panicula* ampla ± aperta, ramis singulis nec fasciculatis tenuibus saepe flaccidis et elongatis arcuatis paulum divaricatis, inferioribus iterum ramosis, superioribus simplicibus subaphyllis. *Folia basalia* longe petiolata, petiolus quam lamina quarta circiter parte brevior vel eam ± aequans, lamina ampla, consistentia tenui, plana vel levissime undata, basi late leviter cordata vel fere truncata, prope basin latissima, usque ad medium vix angustata deinde apicem versus sensim attenuata, apice subrotundata vel late acuminata, ad 27 cm longa, ad 15 cm lata sed verosimiliter saepe amplior, nervis lateralibus inferioribus angulo ± 80° vel fere recto a costa mediana abeuntibus arcuato- et reticulato-anastomosantibus. *Folia caulina* inferiora late vel elongate ovato-triangularia, ad 34 cm longa, ad 17 cm lata, in sicco tenuiter papyracea, prope basin latissima, ibique leviter cordata vel truncata, apicem versus sensim angustata acuta; folia caulina superiora anguste lanceolata, latitudine ± 4-plo longiora, infra medium latissima, nervis lateralibus angulo 60–80° abeuntibus. *Florum glomeruli* primum multiflori sed floribus plurimis quoque evidenter sterilibus mox deciduis deinde laxi, infimi tantum interdum foliati et remoti, superiores confluentes. *Pedicelli* fructiferi tenuiter filiformes, quam valvae usque sesquilingiores, prope basin tenuiter distincte articulati, ad basin perigonii subito incrassati. *Perigonii foliola exteriora* 2,5 mm vel ultra longa, dimidiam latitudinem valvae fructiferae interdum superantia. *Valvae* in statu submaturo tenuiter membranaceae, vario modo evolutae, aut subcordato-triangulares acutissimae, 4–5 mm longae, ± 4 mm latae, tenuiter reticulato-nervosae nervo mediano interdum leviter longitudinaliter incrassato non callifero, margine prope basin minute irregulariter sinuato-vel eroso-denticulatae, aut valvae cordatae vel scutiformi-cordatae acuminatae, interdum longitudine latiores, raro autem irregulariter calliferae, partim apice linguiformi-productae. *Nux* immatura ± 2 mm longa, pallide brunnea, infra medium latissima, apicem versus sensim angustata.

Azores.

Island of St. Michaels (HUNT 216, G (Herb. DC.), K, BM).

R. Caldeirarum has been mentioned as a synonym of *R. aquaticus* by MEISNER (1856). The specimens seen by me are sterile and very like *R. aquaticus* × *obtusifolius*, a hybrid rather common in some parts of Central and Northern Europe (see RECH. f., Beih. Bot. Centralbl. 49/2: 88 (1932)). My interpretation of *R. Caldeirarum* as a hybrid between *R. azoricus* and *R. obtusifolius* ssp. *agrestis* may be right in spite of the fact that I have not seen specimens of both parents from the Island of St. Michaels.

Subject. b. Patientiae.

RECH. FIL. in Fedde Repert. 31: 230 (1933).

Perennes. Folia pallide viridia, latitudine 2—4-plo longiora, basalia et caulina inferiora in medio circiter latissima, basi leviter cordata vel rotundata vel cuneata. Petiolus supra planus. Valvae rotundato-cordatae integrae vel rarius minute denticulatae, una plerumque callum sero evolutum et induratum proferens, rarius omnes calliferae vel omnes ecallosae.

32. *Rumex Ginii* JAHAND. et MAIRE.

JAHAND. et MAIRE, Mem. Soc. Sc. Nat. Maroc., 7: 96 (1924) nomen; JAHAND. et MAIRE, Bull. Soc. Hist. Nat. Afr. Nord 16: 7 (1925) descr.

Radix perennis valida, plerumque caulem singulum proferens. *Caulis* 30—60 cm altus, infra inflorescentiam circiter tertiam partem superiorem caulis occupantem non ramosus, brunnescens, leviter sulcato-striatus. *Folia* omnia in vivo verosimiliter subcarnosa, in sicco crasse membranacea, plana, costa mediana et petiolo in pagina superiore applanata, pallide, viridia, nervi secundarii angulo ca 60—80° a costa mediana abeuntes, folia basalia petiolo lamina dimidio breviora usque subaequante suffulta; lamina e basi leviter cordata vel truncata rarius rotundata vel attenuata oblongo-lanceolata, apice acuta rarius obtusiuscula, nervis lateralibus angulo 70—90° abeuntibus, folia caulina pauca, decrescentia, brevius petiolata, proportionem angustiora. *Inflorescentia* densa, ramis brevibus ± arcuato-erectis, inferioribus fasciculatis, in parte inferiore paucifoliata, verticillastris contiguis. *Pedicelli* tenues inaequales, perigonio (1—) 1,5 (—2) -plo longiores, prope basin articulati. *Foliola exteriora* ca. 2 mm longa, basibus interiorum appressa. *Valvae* (imaturae) 5 mm longae, 6 mm latae, ovato-cordatae,

longitudine saepe sublatores, subintegrae vel obsolete denticulatae, tenuiter reticulatae, pallide virides vel rubro-suffusae, unica callifera, ceterae ecallosae vel callis rudimentariis praeditae.

Morocco.

Moyen Atlas, Bekris, champs, 1850 m (JAHANDIEZ 755, G (Herb. Del.), BM, LD). Moyen Atlas, Dai et Achlef, herbeux sablonneux, 1750 m (JAHANDIEZ 496, P, LD). Atlas medius: Ras-el-ma prope pagum Azrou, in prato humido, 1600 m (LINDBERG 4455, W, S, LD).

In horto bot. Lund cultus e seminibus Maroccanis ab Herb. Alger distributis (MURBECK s.n., LD).

This species deserves special interest as the only African representative of the Subsect. *Patientiae*. When dealing with that Subsection (RECH. F., Fedde Repert. 31: 225—283 (1933)) I was not aware of the existence of this species, nor did I know of the occurrence of a plant very closely related to *R. Patientia* in the Apennines (RECH. F., »Sull indigenato de *Rumex Patientia* in Italia» in Archivio Botanico 12 (1936)). So possibly this Subsection was formerly more widely spread throughout the mountains of the Mediterranean and its borderlands.

R. Ginii can easily be distinguished from *R. Patientia* by its stouter habit, smaller leaves with lateral nerves forming a less acute angle with the midrib, upper stem leaves rounded at base and supported by longer petioles, valves often broader than long with stronger reticulation, and shorter subovate nuts. The valves are always denticulate recalling those of *R. cristatus* DC. (*R. graecus* BOISS. et HELDR.).

R. Ginii varies in habit and leaf outline. In JAHANDIEZ 496 the basal leaves are 1 1/2 to 2 1/2 times as long as broad and slightly cordate at base, the inflorescence beginning nearly at the base of the stem. In LINDBERG 4455 the stem is much taller, the internodes are more elongated, up to 10 cm long, the inflorescence begins in the middle or upper third of the stem, the acute leaves are much narrower, up to nearly 4 times as long as broad, rounded or short-cuneate at base, and the petioles of the lower leaves are up to half as long as the blade.

Subsect. c. *Crispi*.

RECH. FIL. in Field Mus. Bot. 17, no. 1: 8 (1937).

Perennes. Folia saturate vel atro-viridia, latitudine 3—6-plo longiora, crispa rarius plana, in medio circiter latissima, apice acuta. Petiolus supra canaliculatus. Valvae rotundato-cordatae, integrae, omnes vel unica callum mox evolutum et induratum ferentes.

33. *Rumex crispus* L.

L., Spec. pl. ed. I: 335 (1753); CAMPD. Monogr. Rum. 66 et 95 (1819); MEISN. ap. DC. Prodr. 14: 44 (1856); MURBECK in Bot. Notiser 1899: 19 (1899); DANSER in Nederl. Kruidk. Arch. 1921: 184 (1922); RECH. F. in Ark. f. Bot. 26/A, 3: 44 (1933); RECH. F. in Field Mus. Bot. 17, 1: 116 (1937); RECH. F. Mitt. Thür. Bot. Ver., N.F. 50: 205 (1943); LOUSLEY in Rep. bot. Exch. Club. 1941—42: 552 (1944); RECH. F., Candollea 12: 80 (1949). *R. elongatus* Guss., Pl. rar. 150, tab. 28 (1826), fide MURB. l.c. 1913: 226 (1913).

Perennis; *caulis* erectus, (0,3—) 0,6—1 (—1,5) m altus, sulcato-striatus, plerumque brunnescens, infra inflorescentiam non ramosus, inflorescentia saepius dimidium superiorem caulis occupante, ramis erectis singulis simplicibus vel in individuis validis inferioribus interdum fasciculatis et ramosis erecto-divergentibus raro subarcuatis, inferne tantum \pm interrupta et foliata, compacta vel \pm aperta. *Folia basalia* \pm anguste lanceolata, basi anguste rotundata vel \pm truncata vel saepius cuneata, in medio circiter latissima, utrinque sensim angustata, apice acuta, margine \pm undulato-crispa rarius fere plana, ad 30 (—35) cm longa, ad 6 (rarius 8) cm lata, petiolata, petiolo quam lamina plerumque multo brevior, superne \pm angustato-carinato. *Folia consistentia* in vivo herbacea subcarnosa, in sicco crassiuscule membranacea vel subcoriacea, nervis lateralibus angulo \pm 45 (—60) $^{\circ}$ a costa mediana abeuntibus, glabra et laevia sed secus nervos subtus interdum minutissime et obsolete papillosa. *Folia caulina* sensim minora brevius petiolata, basi \pm anguste rotundata vel \pm late cuneata, interdum \pm infra medium latissima. *Folia summa* saepe fere linearia. *Florum glomeruli* multiflori contigui vel inferiores \pm remoti. *Pedicelli* fructiferi longitudine variabiles, quam perigonium (1 1/2—) 2—2 1/2-plo longiores, filiformes, in tertia circiter parte inferiore tenuiter incrassato-articulati. *Pergonii foliola exteriora* dimidia latitudine valvarum vix breviora, basibus earum appressa vel subreflexa. *Valvae* fructiferae 3,5—5 (—6,5) mm longae et circiter aequilatae, membranaceo-subcoriaceae, subinaequales, rotundato- vel oblongo-cordatae rarius subtriangulares, facie tenuiter subaequaliter reticulato-nervosae, margine integrae vel rarius minute et indistincte crenulatae vel rarissime paulum eroso-denticulatae, omnes aequaliter vel inaequaliter vel valva unica (anterior) tantum callifera, callo maiusculo prominente subsphaerico- vel ovato-fusiformi sublaevi plerumque brunneo-aurantiaco. *Nux* 2—3 (—3,5) mm longa, infra medium latissima crassiuscula, castanea, basi brevius, apice longius acuminata.

Distr.-geogr.: Nunc in toto fere orbi terrarum; in Europa et Asia occidentali certe spontaneus.

Algeria.

Alger, lieux humides (MUSTAPHA BRICHI s.n., S). Hussein (M. GANDOGER 431, BM).

Tunis.

Tunetia media: Zaouia Sidi Abd-el-Melek (MURBECK s.n., S).

Egypt.

Nildelta (coll. ign., FI).

Ethiopia.

Eritrea: Hamasen, Mai Meleghen pr. Ait Guadad, 2300 m (PAPPI 329, FI).

Southern Rhodesia.

Distr. Matopos, weed in Old Land (RATTRAY 395, PRE). Melsetter, Martin Forest Reservation, ca. 4500 ft. (N. C. CHASE 3003, SAL.), Salisbury (J. B. HOPKINS 7472, SAL.).

Transvaal.

Distr. East-Rand: Benoni (R. D. BRADFIELD 128, PRE). Irene (R. F. A. ROGERS 11404, GRA). Distr. Lydenburg: Bei der Stadt Lydenburg (F. WILMS 1276, E, K); Belfast (J. BURTT-DAVY 1384, K). Distr. Ermelo, P. O. The Gem (G. F. WALKER 98, PRE). Moodies, 1350 m (G. THORNCROFT 774, NH). Potchefstroom, Elandsfontein (J. J. THERON 1230, NH). Distr. Pretoria: Fountains Valley, on wet banks (J. E. REPTON 70, PRE); Groenkloof (K. A. LANSDELL 863, PRE); Les Marais Area (J. E. REPTON 3111, PRE); Pretoria (J. BURTT-DAVY 833, PRE); Left bank of Apies River, below Prinshof grounds (C. A. SMITH 1444, 1454, PRE); Bayiaanspoort, near outspan on left bank of river, 1500 m (C. A. SMITH 1075, PRE); Pretoria, along Apies River (J. BURTT-DAVY 833, K). Warmbaths (R. LEENDERTZ 1548, K). Witwatersrand, Van Wyks Rust, 12 miles S of Johannesburg, in vlei (G. GERSTNER 6508, NH).

Natal.

Weenen (H. P. THOMASSET s.n., PRE).

Basutoland.

Outhing-Distr. (DIETERLEN s.n., PRE).

Orange Free State.

Distr. Bethlehem: Near Village, side of stream, growing among bamboo (E. P. PHILLIPS 3077, GRA, PRE); Bethlehem, 1350 m (E. P. PHILLIPS s.n., PRE). Rouxville, on veld at Zastrom (J. E. MAREE 10, PRE).

Cape Province.

Bloukrans (S. SCHÖNLAND 395, GRA). Capetown, Lakeside, *Phragmites* swamp (ADAMSON 3703, PRE). Mt. Currie, common on stream-banks and along streams (A. P. GOOSSENS 347, PRE). Distr. Grahamstown: Grahamstown (J. BURTT-DAVY 12134, PRE), roadside (coll. ign., GRA); Redhouse (J. V. PATERSON 84, GRA); Constantia (WOLLEY-DOD 2243, BM). Diep River (R. MAR-

LOTH 7303, PRE); HUTCHINSON (T. P. H. ACOCKS 9612, PRE); Howieson's Poort (S. SALISBURY 441, GRA). Distr. Humansdorp, Slang River, open dune veld (G. S. SPEARMAN 58, PRE). Distr. Kimberley: Herbert Div. Douglas (M. WILMAN 1914, KMG); Soutpan, common on river bank (A. BRUECKNER 1007, PRE; 1335 KMG); Warrenton, on the alluvium (M. WILMAN 1913, KMG). Distr. Middelburg: Gryskop, weed in sands (G. C. THERON 376, PRE). Rondebosch, washland (R. S. ADAMSON 951, PRE). Vygieskraal River near Farm (A. H. WOLLEY-DOD 3592, K).

Azores.

Island of St. Michael (HUNT 218, E, U).

Madeira.

Madeira: Valle Villa (R. T. LOWE s.n., BM); Brava, 3000 ft. (R. T. LOWE s.n., BM).

Ganary Islands.

Teneriffe (A. TULLGREN s.n., BM).

Cape Verde Islands.

St. Yago vall. interioribus (without coll., K).

St. Helena.

St. Helena (BURCHELL s.n., K; BANKS & SOLANDER s.n., BM).

Tristan da Cunha.

Tristan da Cunha, introduced (without coll., BM).

Madagascar.

Tsaratanana (HUMBERT 18471 bis, P); Tananarive (GENEAUD s.n., P); Ambohipotsy (DECARY s.n., P); Tanandava (LE MYRE DE VILERS s.n., P).

Bourbon (Reunion).

Bourbon (I. B. BALFOUR s.n.; K, hb. MOQUIN-TANDON s.n., P).

Mauritius.

Mauritius, Curepipe (H. H. JOHNSTON s.n., K).

Rodrigues.

»Rodrigues» (I. B. BALFOUR s.n., K).

34. *Rumex algeriensis* BARRATTE & MURBECK.

BARRATTE et MURBECK, Contr. Fl. Nord Ouest Afr. III—IV in Acta Univ. Lund 35, II, No. 3: 6 (1899), tab. 11, fig. 3, 4.

Perennis. *Caulis* 90 cm et ultra altus, erectus, ex internodiis pluribus compositus ideoque plurifolius, valde striatus, etiam in parte inferiore profunde grosseque sulcatus, infra medium simplex, superne ramos plures floriferos modice elongatos emittens. *Folia omnia* glaberrima, apice attenuata, acuta; radicalia longissima, sublinearia: petiolus 32 cm longus, lamina circ. 20 cm longa, circ. 5 cm lata, margine undulato-erosula; *caulina inferiora mediaque* brevius petiolata (pet. 20—6 cm.), lamina 24—20 cm longa, circ. 1—1.5 cm lata, margine plus minus undulata, ima basi, sicut quoque foliorum radicalium, latior ibique saepius profunde cordata; superiora sensim decrescentia, lineari-lanceolata, utrinque cuneato-attenuata. *Rami floriferi* ascendentes, satis elongati, saepius 8—10, cum parte terminali caulis virgata paniculam laxam angustam formantes. *Verticillastri* inferiores distantes, multiflori, saepius e floribus 20—30 compositi, ceteri minus minusque remoti sed haud confluentes, 6—20-flori. *Pedicelli* fructiferi filiformes, valde inaequilongi, maiores perigonio circ. 3-plo longiores, apice parum incrassati, infra medium articulati. Perigonii fructiferi phylla exteriora oblongo-linearia, marginibus basilaribus interiorum subappressa eosque non excedentia. *Valvae* ambitu cordatae vel saepius cordato-triangulares, obtusae, subchartaceae, 6 mm longae, venis modice elevatis laxe reticulatae, margine integerrimas, mediana (externa) 4—5 mm lata, callo grosso laevi oblongo tertiam partem valvae longitudinis aequante vel vix longiore munita, laterales paulo angustiores basi callo destitutae et tantum nervo inferne subincrassato donatae. *Nux* 3—3.5 mm longa, badia, lateribus concaviusculis late fusiformibus ad medium latioribus.

Algeria.

Marais près de Maison-Carrée (DUVAL-JOUVE, BATTANDIER), non vidi; Reghaïa (BATTANDIER), non vidi; Lieux aquatiques près de Bône (DUKERLEY, REBOUD), non vidi. Maison blanche (BATTANDIER et TRABUT 85, HAUSSKNECHT LD, UPS); Oued Smar (MALINVAUD s.n., P, ZT); Waldzone La Reghaïa, östlich von Algier (REESE s.n., hb. REESE); Oued Smar près de Maison-Carrée (MAIRE s.n., S). E seminibus ab Hb. Alger distributis. Semin. Mart. 1928 (MURBECK, LD). Oued Smar (BATTANDIER 2048, P).

R. algeriensis has narrow linear undulate leaves, cordate at base as in *R. tunetanus*, from which it differs by the sulcate stem, more branched panicle, many flowered whorls, longer pedicels, and entire narrower valves.

Subsect. d. *Stenophylli*.

RECH. FIL. in *Candollea* 12: 89 (1949).

Perennes. Folia basalia et caulina inferiora saturate viridia, latitudine usque 6-plo longiora, in medio circiter latissima, apice acuta. Valvae ambitu cordatae, omnes calliferae, callis mox evolutis, margine semper crebre argute denticulatae.

35. *Rumex tunetanus* BARRATTE & MURBECK.

BARRATTE et MURBECK, Contr. Fl. Nord Ouest Afr. III—IV in *Acta Univ. Lund* 35, II, No. 3: 5 (1899), tab. 11, fig. 1, 2.

Perennis. *Caulis* circiter 80 cm altus, erectus, strictus, rubescens, ex internodiis paucis elongatis compositus ideoque paucifolius, infra medium simplex leviter striatus, superne ramos paucos floriferos breviusculos emittens ibique sulcato-striatus. *Folia* basilaria ignota; *caulina* omnia angustissima, glaberrima, acuta, margine undulato-vel eroso-crispa, infima longissima, sublinaria, petiolus ca 18 cm longus, lamina 18—20 cm longa, 0.8—1.4 cm lata, media et suprema brevius petiolata, sensim decrescentia; lamina foliorum omnium ima basilior ibique plus minus profunde cordata, summorum tantum basi cuneato-attenuata. *Rami floriferi* ascendenti-patuli, in speciminibus visis numero 2—4, parum elongati, cum parte terminali caulis elongato-virgata paniculam laxam aphyllam formantes. *Verticillastri* inferiores plerumque distantes, e floribus 11—16 compositi, caeteri approximati, sed vix confluentes, 2—10-flori. *Pedicelli* fructiferi subfiliiformes, rigidiusculi, perigonio aequilongi vel sublongiores, apice paulum incrassati, infra medium articulati. *Perigonii* fructiferi foliola *exteriora* lingulato-vel oblongo-lineararia, marginibus basilaribus interiorum subappressa eaque non excedentia. *Valvae fructiferae* ambitu cordatae vel late cordato-triangularae, chartaceae, venis modice elevatis dense reticulatae, apice brevissima obtusiusculae, margine utroque dentibus 5—8 triangularibus vel lanceolatis inaequilongis, diametro valvarum sexies ad decies brevioribus praeditae, mediana (externa) 5—6.5 cm longa, 4.5—6 mm lata, callo grosso laevi oblongo-ovoideo dimidiam valvae longitudinem aequante vel paulo longiore munita, laterales paulo breviores angustiores, basi callo multo minore instructae. *Nux* 2.7—3 mm longa, badia, lateribus convexiusculis late ovatis, paulo infra medium latior.

Tunis.

Bords du lac Cejenan (COSSON & BARRATTE s.n., Typus, P); Kroumirie orientale, bords du lac Cejenan (COSSON, BARRATTE, DUVAL s.n., P).

Characterized by its slender fistulous stem, narrow linear undulate leaves with deeply cordate base, and strongly reticulated denticulate valves. The leaf form is exactly the same as in *R. algeriensis*, which differs in its fruiting perianth.

Subsect. e. Conglomerati.

RECH. FIL. 1937: 8.

Perennes. Folia basalia et caulina inferiora latitudine usque triplo longiora, basi cordata. Rami inflorescentiae singuli, arcuato-divergentes. Florum glomeruli omnes remoti. Pedicelli fructiferi perigonio ad summum 1.7-plo longiores. Valvae lingulatae, parvae, omnes vel unica calliferae.

36. *Rumex conglomeratus* MURR.

MURR., Prodr. Stirp. goett. 00: 52 (1770); MEISN. ap. DC. Prodr. 14: 59 (1856); RECH. F. in Field Mus. bot. 17, No. 1: 121 (1937); LOUSLEY in Bot. Exch. Rep. 1938: 132 (1939); RECH. F., Candollea 12: 96 (1949).

R. nemolapathum EHRH., Beitr. 1: 181 (1787) p.p.; CAMPD. Monogr. Rum. 91 (1819).

R. glomeratus SCHREB., Spicil. Fl. Lips. Index 155, no. 300 (1771).

R. paludosus WITHERING, Bot. Arr. brit. Pl. ed. 2: 354 (1796).

R. acutus SM., Fl. brit. 1: 391 (1800); SM. Engl. Bot. 11: 724 (1800).

Perennis. *Caulis* erectus, inferne \pm strictus, superne vel rarius omnino flexuosus, tenuiter sulcato-striatus, brunnescens interdum purpurascens, (20—)30—80(—120) cm altus, saepe iam a basi vel rarius a medio tantum in ramos arcuato-divaricatos saepe elongatos inferiores iterum ramosos inflorescentiam apertam \pm amplam formantes divisus. *Folia basalia* petiolata, petiolo laminam \pm aequante interdum superante, lamina parva, ad 16 cm longa, ad 5 cm lata, glabra laevis tenuiter membranacea, laete viridis, plana, basi leviter cordata vel truncata, ambitu anguste oblongo-ovata, apice rotundato-obtusa. *Folia caulina* e basi leviter cordata vel rotundata oblongo-ovata vel ovato-lanceolata, acutiuscula vel breviter acuminata, extremo margine interdum subcrispata. *Florum glomeruli* \pm multiflori, omnes remoti, omnes plerumque folio suffulti. *Pedicelli* fructiferi perigonium maturum \pm aequantes, subcrassiusculi, \pm rigiduli, in medio circiter vel paulo infra articulati, raro tantum perigonio longiores. *Perigonii foliola exteriora* late lingu-

lata acutiuscula vel obtusiuscula, dimidia latitudine valvarum manifeste longiora. *Valvae fructiferae* subaequales, 2.5—3.2 mm longae, 1—1.7 mm latae, consistentia subcoriacea, oblongo-ovatae integrae vel subintegrae, marginibus subparallelibus vel apicem rotundatam versus insensibiliter attenuatae, omnes subaequaliter calliferae; calli bruneo-aurantiaci valde prominentes sublaeves oblongo-ellipsoidei vel oblongo-ovati, saepe totam fere faciem valvae occupantes. *Nux atrobrunnea*, 1.3—1.7 mm longa, crassiuscula, paulum infra medium latissima, apice breviter, basi brevissime acuminata.

Distr.geogr.: Asia centralis (Pamir-Alai, Syr-Darja, fide Losinskaja), Montes Turkmeniae, Persia, Mesopotamia, Caucasus, Transcaucasia, Rossia europaea australis, Syria, Palaestina, Anatolia, Europa media et australis, Africa borealis. — In Asiam orientalem, Africam australem, Australiam et in multas terras alias introductus.

Morocco.

Atlas magnum, in convalle fl. Reraia, prope pagum Asni, in nemore paludoso, 1200 m (H. LINDBERG 3384, LD, S). Djebel Habibi (GANDOGER s.n., LD). Prope oppidum Marrakech, juxta Oued Tensift, 450 m (H. LINDBERG 2923, LD). Prope oppidum Mogador, in ripa fluvii Oued Ksob (H. LINDBERG 2031, LD, S). SW-Marocco, Ida Oubouzia (ex Herb. BALL, FL). Taroudant (IBRAHIM, G).¹ Ulad-Settut, alluv. du Muluja (SENNEN et MAURICIO s.n., BM). Afra, Pozos de Ermilo, Beni-Bu-Jahi (SETLER s.n., BM). Martinprey-du-Kiss (FAURE, Herb. REESE). 23 km südwestlich von Casablanca (REESE s.n., Herb. REESE).¹

Algeria.

Tlemcen (FAURE s.n., Herb. REESE).¹

Tunis.

Zaghouan, in arboretis umbrosis (KRALIK s.n., G. (Hb. Boiss.)).

Cyrenaica.

Cyrenaica: Derna (TAUBERT 686, G (Hb. Boiss.)).

Transvaal.

Distr. Klerksdorp, Convent of the Sacred Heart (Sister M. DE VICTORIA 93, PRE). Distr. Potchefstroom: Dassiesrand (N. v. D. WESTHUZEN 891, PRE), Nooitgedacht, stream bank in shallow water, rare (W. J. LOUW 1647, PRE). Distr. Pretoria: Wonderboom near Pretoria (J. BURTT-DAVY 3346, PRE). Bon Accord (MEEBOLD 12092, NY).

¹ forma pedicellis longioribus; vide RECH. F. 1949.

Natal.

Weenen (H. P. THOMASSET s.n., PRE); Maritzburg (W. R. McCLUNG 27435, NH).

Cape Province.

Distr. Capetown: Kenilworth prope Capetown, in fossis (H. BOLUS 7039, K). Distr. George: Roadside through forest E. of Klein Zwart River (H. G. FOURCADE 4490, K). Gonkama (HAFSTRÖM & LINDEBERG s.n., S). Grahamstown, Springfields (J. V. PATERSON 3293, GRA). Riversdale (MUIR 1905, PRE). Uitenhage (HAFSTRÖM & LINDEBERG s.n., S). Waste places near Albertina (MUIR 1905, PRE). Stellenbosch, Bergplätze bei Klappmuts, 500—1500 ft. (ECKLON & ZEYHER s.n., S).¹

Madeira.

Madeira (N. J. ANDERSSON s.n., S; W. HILLEBRAND s.n., S; BANKS & SOLANDER s.n., BM). S. Martinho (R. P. MONIZ s.n., BM). Shore near Funchal (R. P. MONIZ s.n., BM). Barranco Sta Cruz (R. T. LOWE s.n., BM). Taganana, up the Vueltas (R. T. LOWE s.n., BM). Madera (R. F. LOWE 614, G (Hb. Boiss.)) (AZNÉR s.n., UPS).

Canary Islands.

Gran Canaria, Firgas (A. C. COOK 378, NY); Teneriffe (BOURGEAU 963, G, GRA, BM) (ex Herb. WEBB, FL).

Azores.

Azoren (HARTUNG s.n., ZT).¹

37. *Rumex brachypodus* RECH. F.

RECH. F. in Candollea 11: 233 (1948).

Verosimiliter perennis. *Caulis* stricte erectus non flexuosus, 80 cm altus, in tertia circiter parte superiore ramosus, ramis brevibus tenuibus singulis simplicibus arcuato-erectis. *Folium basale* (singulum visum) longe (17 cm) petiolatum, petiolus in vivo carnosus fuisse videtur, lamina e basi sinuato-truncata subcordata ambitu ovato-oblonga, membranacea, plana, laete viridis, 18 cm longa, 6.5 cm lata, marginibus a basi ad medium fere parallelis deinde angustata, acuta, nervo mediano crasso, lateralibus tenuibus numerosis angulo $\pm 80^\circ$ a mediano abeuntibus levissime arcuatis. *Folia caulina* superiora deficientia; folia ramos inflorescentiae fulcrantia e basi subtruncata vel late rotundato-cuneata lanceolata acuta, latitudine 4—5-plo longiora. *Florum*

¹ forma pedicellis longioribus.

glomeruli summis exceptis omnes remoti, omnes aphylli, multiflori. *Pedicelli* fructiferi crassi perbreves, in medio vel paulo infra distincte articulati. *Perigonii foliola exteriora* perbrevia lata acuta, basibus interiorum appressa. *Valvae* \pm 2 mm longae, 1.2 mm latae, obovato-lingulatae, obtusiusculae vel acutiusculae, integrae, omnes aequaliter calliferae; callus auratus ovato-globosus valde prominens, totam latitudinem valvae occupans. *Nux* 1.5 mm longa, 1.2 mm lata, prope basin latissima, ibique late truncato-rotundata, apice breviter acuminata atrofusca. — Ab affini *R. conglomerato* forma et nervatura foliorum basalium, ramis brevibus erectis vix divaricatis, florum glomerulis aphyllis, imprimis autem pedicellis brevissimis quam valvae saepe brevioribus, valvis minutis diversus.

Morocco.

Habitat in marginibus herbosis fluvii Ktamae (Atlante riphaeo) ad 1500 m alt., 12. Juni 1929 (FONT QUER, Iter maroccanum 1929, 105 sub *R. congl.*, Typus in Herb. Mus. Brit).

Closely related to *R. conglomeratus* MURR. from which it is distinguished by the outline and nervation of the basal leaves, the short scarcely divergent branches of the inflorescence, the leafless whorls, and especially by the very short pedicels (often somewhat shorter than the fruiting perianth) and the very small valves with very large grains covering their whole surface.

Subsect. f. *Obtusifolii*.

RECH. FIL. in Field Mus. Bot. 17, no. 1: 8 (1937).

Perennes. Folia basalia basi cordata plana, longitudine circiter duplo longiora. Pedicelli fructiferi perigonio 1—2.5-plo longiores, in vel infra medium articulati. Valvae saepius dentatae, omnes vel unica calliferae.

38. *Rumex obtusifolius* L.

L., Spec. pl. ed. I: 335 (1753); RECH. F. in Beih. Bot. Centrbl. 49/2: 41 (1932); RECH. F., Candollea 12: 100 (1949).

Lapathum silvestre LAM., Fl. fr. 3: 4 (1778).

Lapathum obtusifolium MNCH., Meth.: 356 (1794).

Perennis. *Caulis* 0.6—1.2 m altus, erectus, striato-sulcatus, viridis brunnescens vel rarius purpureo-suffusus, a medio ramosus et fructifer,

ramis arcuato-patentibus non contiguis paniculam amplam apertam formantibus. *Foliorum basalium lamina* e basi cordata late oblongo-ovata, latitudine ad summum duplo longior, tenuis, saturate viridis, plana, basi cordata apice rotundato-obtusa vel acutiuscula, nervis secundariis angulo $45-60^\circ$ a costa mediana abeuntibus, petiolo lamina plerumque longiore. *Folia caulina* inferiora e basi cordata late oblongo-ovata rotundato-acuminata, summa e basi rotundata ovato-lanceolata sensim attenuata, acuta, plana vel subundata. *Florum glomeruli* plurimi remoti, superiores in statu fructifero contigui, infimi saepe folio suffulti. *Pedicelli* fructiferi tenues, in quarta vel tertia parte inferiore distincte articulati, ad basin perigonii sensim dilatati, perigonio ad $2\frac{1}{2}$ -plo longiores. *Perigonii foliola exteriora* prorsus curvata vel patentia, acumine incurvo, dimidia latitudine valvarum saepius longiora. *Valvae* fructiferae aequales vel subaequales, forma valde variabiles (confer descriptiones subspecierum), basi truncatae, apice saepe linguiformi-productae, membranaceae, tenuiter subirregulariter reticulato-nervosae, nervis apicem valvae versus saepe \pm evanescentibus. *Nux* 2.5—3.2 mm longa, supra basin latissima, brunnea.

Icon: Confer RECH. F. Beih. Bot. Centrbl. 49/2: 41 (1932).

Distr.geogr.: Europa omnis, regione arctica et subarctica et mediterranea exclusa; Asia occidentalis, In Asiam orientalem, Americam borealem et australem, Africam australem et Australiam introductus.

In Africa tantum occurrit:

I. Ssp. *agrestis* (FR.) DANSER.

DANSER, Neederl. Kruidk. Arch. 1925: 424 (1926); Bull. Jard. bot. Buitenzorg, ser. 3, 8: 129 (1927); RECH. F., Beih. Bot. Centrbl. 49/2: 45 (1932).

R. obtusifolius var. *agrestis* FRIES, Novit. Fl. succ. ed. 2: 99 (1828); MURBECK, Bot. Notis. 1899: 31 (1899).

R. divaricatus FRIES, Mant. 3: 35 (1842) non L.

R. Friesii GREN. & GODR., Fl. fr. 3: 36 (1855—56) non ARESCHOUG (1836).

R. obtusifolius var. *Friesii* DÖLL, Fl. bad.: 598 (1859).

R. obtusifolius ssp. *Friesii* RECH. PAT. in Oesterr. Bot. Zeitschr. 42: 51 (1892); DANSER in Neederl. Kruidk. Arch. 1921: 208 (1922).

R. obtusifolius WALLR., Schedae crit. 1: 161 (1822); RECH. F., Candollea 12: 101 (1949) et auct. Europae occid.

Valvae fructiferae ovato-triangulares, obtusae vel obtusiusculae, \pm 6 mm longae, una (Typus) vel omnes (f. *trigranis*) calliferae, margine dentatae, raro integrae (f. *subdentulus*), dentes latitudinem valvae aequantes vel breviores, raro superantes (f. *subulatus*). Petioli et

folia imprimis in pagina inferiore secus nervos saepe pubescenti-scabra.

Icon: RECH. F., Beih. Bot. Centrbl. 49/2: tab. 2, fig. 16 (1932).

Distr.geogr.: Europa media et occidentalis. — In Africam, Asiam orientalem et australem et in Americam introductus.

Cape Province.

Alice, ca. 800 m (J. P. H. ACOCKS 9754, PRE). Distr. Kentani, along streams and moist places (A. PEGLER 1407, GRA). Newton near Willowmore (T. COMBER s.n., GRA).

Madeira.

(MASON s.n., P; HILLEBRAND s.n., NH.)

Tristan da Cunha.

(K. KEYTEL s.n., K.)

Gough Island.

(R. & R. BROWN s.n., K.)

For further details see RECH. F., Beih. Bot. Centrbl. 49/2: 52 (1932).

39. *Rumex pulcher* L.

L., Spec. pl. ed. I, 336 (1753) s.str.

Perennis. *Caulis* 0.2—0.6 m altus, sulcatus, erectus, strictus vel saepius angulato-flexuosus, saepe iam in parte inferiore divaricato- vel refracto- et intricato-ramosus, rarius simplex vel subsimplex vel apice tantum ramosus, saepe ut folia, petioli et ochreae papillis albis dense obsitus. *Folia basalia* e basi cordata ovato-oblonga, margine crispula, apice obtusiuscula, latitudine circiter duplo longiora, in dimidie inferiore interdum panduriformi-contracta, in vivo carnosa, in sicco crasse membranacea, parva, petiolo lamina breviora vel rarius aequilongo. *Folia caulina* breviora petiolata, e basi cordata ovato-oblonga acuta, in folia florum glomerulos fulcrantia sursum sensim decrescentia transientia. *Florum glomeruli* omnes remoti, omnes folio suffulti, sed folia summa plerumque minutissima, glomerulos non superantia. *Pedicellus* fructifer perigonio plerumque brevior rarissime aequilongus, robustus, crassus, in medio vel saepius paulo infra articulatus. *Perigonii foliola exteriora* dimidiam latitudinem valvae aequantia vel paulo superantia. *Valvae* crasse coriaceae, rigidae, forma valde variabiles (vide subspecies), 4.5—6 mm longae, 2.5—4.5 mm latae, faciebus foveolato-rugosae vel crasse reticulato-nervosae, margine integrae subintegrae vel saepius vario modo dentatae, omnes inaequaliter vel rarius subaequaliter

calliferae; calli ovato-oblongi, apice acuti, prominentes, plerumque verrucosi vel rugosi. *Nux* 3—4 mm longa, infra medium latissima.

Distr.geogr.: Regio mediterranea, in Europam atlanticam et in Europam austro-orientalem et Asiam anteriorem irradians, in Americam introductus et partim inquilinus. Crescit in declivibus siccis, in lapidosis, ad viarum margines, in cultis et incultis, in regionibus siccis in locis irrigatis. — Tab. geogr. RECH. F. in Beih. Bot. Centrbl. 49/2: 131 (1932).

Mauritius.

Mauritius (R. E. VAUGHAN 537, K).

Algeria.

Constantine (COSSON s.n., Br).

Cape Province.

Weedy Garden, Grahamstown (ohne Sammler, GRA); Roadside beyond Wynberg (A. H. WOLLEY-DOD s.n., K). Sumpfige Stellen unter dem Löwenberge (ECKLON 709, St).

Rumex pulcher L. ssp. *eupulcher* RECH. F.

RECH. F., Beih. Bot. Centrbl. 49/2: 26 (1932).

Syn.: *R. pulcher* L., Spec. pl. ed. I., 336 (1753) s.str.; CAMPD. Monogr. Rum. 64 et 82 (1819); MEISN. ap. DC., Prodr. 14: 581 (1856) et auct. plur. p.p.

R. pulcher L. v. *heterodus* BECK in RCHB. Icon. 24: 40 (1909); saltem p.p. *Lapathum sinuatum* LAM., Fl. France 3: 5 (1878).

Lap. pulchrum MOENCH, Meth. Suppl. 121 (1802).

Valvae fructiferae oblongae vel ovato-triangulares, plerumque inaequaliter calliferae apice obtusiusculae vel acutiusculae, in utroque latere calli una vel duo maculae nervaturae; utrinque dentes 4—5, dimidiam latitudinem valvae aequantes vel breviores. *Folia*, petioli et ochreae pubescentia, glabrescentia vel glabra; folia basalia saepe panduriformi-contracta.

Distr.geogr.: Regio mediterranea, in Galliam, Britanniam et Hungariam irradians. In Oriente rara. Ceterum in Europam et Americam introductus.

Algeria.

Oran, vallon de Noiseur (A. FAURE s.n., S).

For further details see RECH. F., Vorarbeiten zu einer Monographie der Gattung *Rumex* in Beih. Bot. Centrbl. 49/2: 33 (1932).

Rumex pulcher L. ssp. *divaricatus* (L.) MURB.

MURB., Beitr. z. Kenntn. d. Fl. v. Südbosn. u. d. Herzeg. 45 (Sep. aus Fysiogr. Sällskap. Handl. B. 2 (Lund 1891); RECH. F. Beih. Bot. Centrbl. 49/2: 35 (1932).

R. divaricatus L., Spec. pl. ed. II, 478 (1762).

R. pulcher var. *microdon* HAUSSKN., Mitt. Thür. Bot. Ver., N.F., 11: 59 (1897); v. *microdus* BECK in RCHB. Icon. 24: 39 (1904); ASCHERS. et GRAEBN., Synops. 4: 706 (1908—13).

R. pulcher var. *micropleiodonta* HAUSSKN., Mitt. Thür. Bot. Ver., N.F. I: 34 (1891).

R. pulcher v. *micropliodus* BECK in RCHB. Icon. 24: 39 (1904); ASCHERS. et GRAEBN. Synops. 4: 707 (1912).

R. brevipes MEISN. ap. DC., Prodr. 14: 55 (1856).

R. Woodsii DE NOT., Cat. sem. hort Rom. 1875; Nuov. Giorn. Bot. It. 8: 42 (1876); ARCANG. Consp. Fl. It. ed. I, 585 (1882) pro var.

Valvae fructiferae ovato-orbiculares, plerumque inaequaliter calliferae, apice integrae, rotundatae vel acuminatae; in utroque latere calli tres maculae nervaturae, utrinque dentes 4—6(—8) dimidia latitudine valvae plerumque multo breviores. *Nux* plerumque maior et magis fusca, prope basin latissima, faciebus fere triangularibus. Subspecies haec quoad habitum et pubescentiam adeo variabilis ac ssp. *pulcher* s. str. sed folia basalia rarius panduriformia.

Distr. geogr.: Asia austro-occidentalis, regio mediterranea praecipue australis. In Europam, Americam et Africam australem introductus.

Morocco.

Melilla (SENNEN & MAURICIO s.n., BM); Zeluars (SENNEN et MAURICIO s.n., BM); Bai-Sidel (SENNEN et MAURICIO s.n., BM); Atlas Rifain, Tolata da Ketamo, 1320 m (SENNEN et MAURICIO s.n., BM); Gurugu, 800 m (SENNEN et MAURICIO s.n., BM); Mogada (REESE s.n., Hb. REESE).

Madeira.

Madeira (LOWE s.n., BM).

Cape Province.

Bedford (J. C. GANE 106, GRA); Carlisle St. Grahamstown (H. SALISBURY s.n., GRA); Knysna (J. D. Keet s.n., GRA); »Albany, Anhöhen auf der rechten Seite des Groot-Vischriver, zwischen Kaffersdrift und Gouverneurskop, 500—2000 ped. (ZEYHER 111, S); Mowbray Flats (R. MARLOTH 7152, PRE).

For further details see RECH. F., Vorarbeiten zu einer Monographie der Gattung *Rumex* in Beih. Bot. Centrbl. 49/2: 37 (1932).

Rumex pulcher L. ssp. *anodontus* (HAUSSKN.) RECH. FIL.

RECH. FIL., Beih. Bot. Centrbl. 49/2: 34 (1932).

Syn. *R. pulcher* L. var. *anodonta* HAUSSKN., Mitt. Thür. Bot. Ver. N.F. 11: 59 (1891).

Valvae fructiferae ambitu ut in ssp. *divaricato* ovato-orbiculares vel triangulari-oblongae, integerrimae vel utrinque dentibus perpauca ad summum $\frac{1}{2}$ mm longis. *Folia* basalia non panduriformia.

Distr. geogr.: Africa borealis, Asia occidentalis.

Algeria.

Oran (FAURE, LD).

Tunis.

Maktar (MURBECK, LD); Sousse (MURBECK, LD); Abd-el Melek (MURBECK, LD).

Libyan desert.

Kleine Oase (ASCHERSON, B).

Subsect. g. *Hamati*.RECH. FIL., in *Candollea* 12: 112 (1949).

Perennes. Folia basalia et caulina inferiora basi cordata vel cuneata. Valvae fructiferae crebre longe dentatae, dentibus apice hamato-incurvis.

40. *Rumex nepalensis* SPR.

SPR., *Syst.* 2: 159 (1825); MEISN. ap. DC. *Prodr.* 14: 55 (1856); DANSER in *Bull. Jard. bot. Buitenz.*, ser. 3, 8: 130 (1926); RECH. F. in *Beih. Bot. Centrbl.* 49/2: 69 (1932).

R. Roxburghianus SCHULT. FIL., *Syst.* 7: 1402 (1830) p.p. saltem e descr.

R. hamatus TREVIR., *Nov. act. Nat. cur.* 13: 174 (1826); MEISN. ap. DC. *Prodr.* 14: 56 (1856).

R. uncinulatus SCHRAD., *Linnaea* 10, Lit. Ber. 71 (1836) e descr.

R. ramulosus MEISN. ap. DC., *Prodr.* 14: 55 (1856).

R. peregrinus BOISS., *Diag.* ser. 1, No. 5: 46 (1844).

R. Esquirolii LÉVL., *Fedde Repert.* 11: 550 (1913).

Perennis. *Caulis* 0.6—1.7 m altus, erectus, in dimidio superiore ramosus rarius subsimplex, ramis erecto-patentibus plerumque singulis simplicibus interdum \pm arcuatis paniculam \pm amplam apertam formantibus. *Foliorum basaliū lamina* late oblongo-ovata, latitudine $1\frac{1}{2}$ — $2\frac{1}{2}$ -plo longior, basi cordata, raro truncata, apice rotundato-obtusa vel acutiuscula, plana, in sicco membranacea, nervis lateralibus angulo 45 — 60° a costa mediana abeuntibus, petiolo lamina subbreviore vel eam aequante. *Folia omnia* subtus, rarius etiam supra ut petioli breviter papilloso-scabra. *Folia caulina* e basi cordata late ovato-lanceolata, folia summa e basi truncata vel rotundata lanceolata acuta, breviter petiolata. *Florum glomeruli* multiflori, omnes remoti, inferiores foliati. *Pedicelli* fructiferi validi, perigonio sesquolongiores, infra medium articulati, ad basin perigonii sensim dilatati. *Perigonii* foliola exteriora dimidiam latitudinem valvae aequantia vel superantia. *Valvae* jam paulo post florendum evidenter dentatae, dentibus utrinque 6—8 in statu fructifero 3—4 mm longis apice hamato-incurvis, denti-

bus summis apicem valvae versus spectantibus; valvae ambitu ovato-triangulares 5—7 mm longae, 3.5—4 mm latae, crassiuscule membranaceae, reticulato-nervosae, apice anguste linguiformi-productae, plerumque unica tantum callifera, callo magno ovato-oblongo, valvae ceterae ecallosae vel nervo mediano \pm incrassato praeditae, raro callos minores ferentes. *Nux* \pm 4 mm longa, atrofusca, infra medium latissima.

Icon.: RECH. F., Beih. Bot. Centrbl. 49/2: tab. 3, fig. 23 (1932).

Distr.geogr.: China austro-occidentalis, montes Himalaya, Afghanistan, Persia borealis, Syria, Anatolia et in locis disjunctis montium Nilghiri, insulae Java et Europae peninsularum balcanicae et apenninicae. — Tab. geogr. RECH. F., Beih. Bot. Centrbl. 49/2: 132 (1932).

Belg. Congo.

»Belgian Congo» La Magua, marais (G. DE WITTE 1422, K); Kamatembe (G. DE WITTE 1599, K).

South Africa.

Natal, Scottburg (CH. WHEELER s.n., BR).

The occurrence in Africa of *R. nepalensis* otherwise strictly confined to Asia, is very puzzling from a phytogeographic standpoint. I do not dare to venture an opinion whether these specimens might have been introduced by human action.

41. *Rumex Steudelii* HOCHST.

HOCHST. in SCHIMP. Pl. abess. no. 380, 883, 933, nomen; A. RICHARD, Tent. fl. Abyss. 2: 229 (1847—51) descr.; WALP. Ann. 3: 292 (1852—53); A. BROWN in Flora 24: 278 (1841); RECH. F. in Beih. Bot. Centrbl. 49/2: 47 (1932); O. SCHWARZ Fl. Trop. Arab. in Mitt. Inst. allg. Bot. Hamburg 10: 32 (1939).

R. Steudelianus MEISN. ap. DC. Prodr. 14: 56 (1856).

Perennis. *Caulis* 40—120 cm altus, crassus, validus, profunde canaliculatus, a basi vel a medio ramosus, ramis erectis vel arcuatis. *Folia basalia* crassiuscule petiolata; petiolus circ. tertiam partem vel dimidiam laminam aequans; lamina lanceolata, latitudine plerumque 3—5-plo longior, crassiuscula, plana, glabra, laevis, basi truncata vel saepius cuneata, apice acuta, in medio vel paulo infra latissima; rarissime folia basalia latitudine tantum 2 $\frac{1}{2}$ plo longior, basi cordata apice rotundata. *Folia caulina* sensim decrescentia, brevius petiolata, basi brevius, apice longius attenuata, acutiora. *Florum glomeruli* inferiores remoti, foliis parvis suffulti, superiores contigui, aphylli. *Pedicelli* fructiferi perigonio \pm sesquilingiores, validiusculi, infra medium articulati, basin perigonii versus incrassati. *Perigonii foliola exteriora* basi

valvarum appressa, earumque latitudinem circ. aequantia usque paulo superantia. *Valvae* fructiferae \pm 5 mm longae, (dentibus exclusis) ca. 3—3.5 mm latae, subaequales, consistentia subcoriacea, in statu maturo fusciscentes, valide reticulato-foveolatae, ambitu ovato-cordatae vel ovato-triangulares, apice late acuminatae, utrinque in dentes validos ca. 6—8 iam paulo post florendum evolutos dimidiam latitudinem valvae plerumque \pm aequantes apice incurvo-uncinatos fissae; valva anterior callum anguste ovato-fusififormem proferens, valvae ceterae nervo mediano longitudinaliter incrassato provisae vel omnino ecallosae. *Nux* 3.5 mm longa, ultra 2 mm lata, matura atrofusca, basi brevissime, apice longius acuminata.

Icon.: RECH. F., Beih. Bot. Centrbl. 49/2: tab. 3, fig. 21 (1932).

Distr.geogr.: Montes Arabiae austro-occidentalis et Africae orientalis. — Tab. geogr. RECH. F., Beih. Bot. Centrbl. 49/2: 132 (1932).

Ethiopia.

Eritrea: Assaorta, Bosco del Caribozzo, 2700 m (PAPPI 2912, FI), Assaorta, Monte Urug, 2547 m (PAPPI 3408, FI); Arbascico—Ad Saddi (TERRACCIANO & PAPPI 398, FI); Betgherghis (BALDRATI 4705, FI); Monte de Corbetta à Maskal (COURBON 137, P); Ocule Cusai, Torrente Baratanti, 2400 (PAPPI 4347, FI); Gheleb, 1900 m (SCHWEINFURTH 1356, G/Boiss.).

Hamasen: Nei terreni argillosi-umidi lungo il Mai Meleghen presso Ad-diche, 2300 m (PAPPI 24, FI); Monti Arbaroba (PAPPI 4582, FI); Asmara, 2400 m (TERRACCIANO & PAPPI 2407, FI; CHIOVENDA 153, FI; PAPPI 4405, FI; PAPPI 4419, FI); Belesa, 2200 m (TERRACCIANO & PAPPI 299, FI); Dem Sabai, 1700 m (PAPPI 17, FI); Colle Lessa, 1940 m (FIORI 910, FI); Lungo il Mai Cinet, 2300 m (PAPPI 77, FI).

Mensa, M. Agaro, 1800—2200 m (TERRACCIANO & PAPPI 532, FI); Mensa, Amba, 2000 m (TERRACCIANO & PAPPI 1344, FI); Mensa, Belta, 1800 m (TERRACCIANO & PAPPI 1232, FI); Mensa, fere Kaurot—Aba Maitan, 750—1600 m (TERRACCIANO & PAPPI 2248, FI); Saganeiti, 2200 m (SCHWEINFURTH & RIVA 1815, G/Boiss., K, NY, S); Sarae, nei pressi di Mai Armaz, 2000 m (PAPPI 37, FI); Sarae, Chessad, Daaro, nelle acque fangose sotto le cascate di Enda Abba Meta, 2000 m (PAPPI 147, FI); Sarae: Lungo il March presso Dabarroa, 1900 m (PAPPI 428); Sarae: Gaza Gabo, 2000 m (PAPPI 98, FI); Sarae: Lungo il torrente di Similté, presso Tachita, 2000 m (PAPPI 5, FI); Scimenzana: Monte Matarà, 2440 m (PAPPI 3140, FI); Tigre: Memsach (QUARTIN-DILLON s.n., P); Tigre: In calc. montis Scholada pr. Adoa (SCHIMPER It. Abyss. Sect. II. 933, P); Tigre: In arvis nivalibus prope Genniam reg. Memsach (SCHIMPER It. Abyss. Sect. I. No. 380, Typus, K, NY, S, W).

Amhara: Semien-Hochland, Quessquessa, auf Aeckern, 10000 ft. (SCHIMPER 883, K, P); Dembia, Gondar (CHIOVENDA 1399, FI).

S c i o a: Addis Abeba (SENNI 1584, FI; BUSCALIONI 826, FI; idem 1369, FI); Slopes of the Mugur Valley, 30 miles north of Addis Abeba, 5—8000 ft. (E. C. SANDFORD, BM); Let-Marefia bei Ancobar (RAGAZZI s.n., FI); Eutatto (NEGRI, 378, FI).

Somaliland.

Shimba Beris, Surud Range, 6750 ft. (COLLENETTE 365, K).

The following specimens are doubtfully referred to *R. Steudelii*. They do not agree completely with this species, nor with any other of the allied ones. They have all been collected in regions where neither *R. Steudelii* nor *R. Bequaertii* occur. They possibly belong to a special taxonomic entity, which can not be defined without study of fresh material. They have been mentioned in literature usually under the name of *R. nepalensis* or *R. obtusifolius*.

Transvaal.

Distr. Pretoria: Fountains Grove (R. LEENDERTZ 654, K); Fountains Valley (T. ERENS s.n., PRE); Distr. Wakkerstroom, Brakfontein near Amersfoort (J. B. DAVY 4179, PRE). Pretoria (MEEBOLD 12088, NY). Mooi River (BURTT-DAVY 11540, PRE).

Orange Free State.

Distr. Kroonstad (J. W. PONT 510, PRE).

Basutoland.

»Basutoland» (J. COOPER 2986, K); Leribe (DIETERLEN 382, K, P, PRE).

Natal.

Charlestown (A. O. D. MOGG 9963, NH); Drakensberg (MAURICE & EVANS 383, NH); Near Umgeni mouth (WOOD 4005, NH).

Cape Province.

By the Kraai River (DRÈGE 1040, K); Bedford (J. C. GANE 143, GRA); Draggasdrift, Graaff Reinet Div., ad rivulos, 3800 ft. (BOLUS 2593, K); Drakensberg, in swamps (MAURICE & EVANS 383, K); Distr. Kentani, along streams and moist places (A. PEGLER 1417, BM, K); Distr. Komgha, waste ground near Komgha (FLANAGAN 1108, 1891, GRA, Z); Majuba Nek, Herschel Distr. (HEPBURN 263, PRE); Harrismith (H. J. SANKEY 253, K); Shiloh (R. BAUR 1134, K); G r i q u a l a n d: Distr. Kimberley, Warrenton, abundant (M. WILMAN 3271, KMG).

Réunion.

»Ile de la Réunion» (M. BOIVIN 1116, P).

The area of *R. Steudelii* in the sense accepted here is most puzzling indeed. It is separated into two parts by a broad zone where *R. Steudelii* is replaced by *R. Bequaertii*, *R. Steudelii* thus being absent in the proper tropics. There are a few localities in Ethiopia where both species apparently occur together as far as one may judge from indications on labels. I have seen neither transitional forms nor hybrids. I am not sufficiently acquainted with the distribution of African plants to be able to decide whether the reappearance in South Africa of a species having its main area in Ethiopia and South West Arabia is extraordinary. On first thought I was inclined to take into consideration introduction by men.

42. *Rumex Bequaertii* DE WILDEM.

DE WILDEM., Pl. Bequaert. 5: 2 (1929); ROBYNS, Fl. Parc Nation. Alb. 1: 116 (1948).

Syn.: *R. camptodon* RECH. F., Beih. Bot. Centrbl. 49/2: 76 (1932).

R. nepalensis auct. afr. p.p., e.g. BAKER & WIGHT, Fl. Trop. Afr. 6/1: 117 (1909); TH. C. E. FRIES, Notizbl. Berl. Dahl. 81: 85 (1924); HUTCH. & DALZIEL, Fl. West. Trop. Afr. 1: 120 (1927) non SPR.

R. Steudelii auct. p.p., e.g. PETER, Fl. Deutsch-Ost-Afr. in Fedde Repert. Beih. 40/2: 200 (1932) non HOCHST. ex Rich.

Perennis. *Caulis* (0.5—)1(—1.5) m altus, erectus, sat gracilis, profunde sulcato-striatus, saepe iam infra medium ramos elongatos tenues floriferos emittens, in nodis infimis interdum rami florendi et fructificationis inflorescentiae primariae temporis abbreviati foliati steriles evoluti. *Inflorescentia* laxa aperta, verticillastri plerumque omnes remoti infimi perpauca tantum foliati. Folia basalia et caulina inferiora petiolata; petiolus lamina pluries brevior; lamina (5—)10—20(—27) cm longa, (1.3—)5(—8) cm lata, latitudine (5—)6—7(—9)-plo longior, lanceolata, in sicco tenuiter herbaceo-membranacea, plana vel margine obsolete crispata, basi anguste cuneata, apicem versus sensim longe attenuata; folia superiora sensim decrescentia brevius petiolata. *Pedicelli* fructiferi longitudine in uno eodemque verticillastro variabiles, perigonium aequantes usque (saepius) eo sesqui usque duplo longiores, prope basin articulati. *Perigonii foliola exteriora* basi interiorum appressa, eorumque dimidiam latitudinem (dentibus exclusis) superantia. *Valvae* fructiferae 3—4 (—4.5) mm longae, dentibus exclusis 1.5—2(—2.5) mm latae, ambitu anguste triangulares, apice anguste linguiformi-productae valde acutae, dentes utrinque ca. 5—6, tenues saepe obliqui, i.e. prorsus spectantes, apice hamato-incurvi, longitudine valvae latitudinem plerumque \pm aequantes; valvae facie tenuiter

elevate reticulato-nervosae, maculis nervaturae saepe transversaliter dilatatis, nervus medianus ceteris crassior magis prominens, interdum — imprimis in valva anteriore — fusiformi- incrassatus nec autem callifer. *Nux* 2—3 mm longa, ad summum 1.8 mm lata, brunnea, infra medium latissima.

Ethiopia.

Eritrea: Assaorta: Bosco del Caribozzo, 2700 m (PAPPI 2829, FI). Hamasen: Asmara (BALDRATI 305, FI). Ocule Cusai: Gruppo dei monti Soyra, altopiano di Golo, 2800 m (PAPPI 1099, FI). Saganeiti, gorge Goua près Addi-Abun, 2100—2000 m (SCHWEINFURTH & RIVA 1334, FI). Saganeiti, Vallée Marakhat, 2100—2200 m (SCHWEINFURTH & RIVA 836, K, G/Boiss.). Amhara: Presso il villaggio di Debra Tabor (PICI SERMOLLI 1561, FI). Galla Sidamo: Adola (VATOVA 616, FI). Tra Uondo et Agheresalam (SACCARDO s.n., FI). Uollega, Sajo-Dembidollo (BENEDETTO 151, FI). Scioa: Addis Abeba, Oletta, 1500 m (BAROLOZZI s.n., FI). Addis Abeba (SENNI 27, FI); Pendici di Entotto verso est, 2600 m (SENNI 998, FI). Addis-Abeba, Unkraut (OSSENT 24, ZT). Harar: Galla Pass, 2500 m 9°28' n., 42°19' w. (GILLET 5164, K, FI). Boran: Arero (Meta-Gafersa), pr. i pozzi, nell'acqua, 2650 m (CUFODONTIS 375, FI).

Anglo-Egyptian Sudan.

Jebel Marra, Darfur, Guloberi Wadi, 2650 m (LYNES 158, BM, K).

British Cameroons.

Cameroon Mt, 3000 m, at No. 2 Hut (MAITLAND 1276, K). Distr. Bamenda: NW slopes of Mba Kokeka Mt. Moist open ground by rocky stream. Erect herb, to 1 m high. 2500 m (R. W. J. KEAY & J. S. LIGHTBODY FI, 28397, K); Lake Oku. High forest around lake. Erect herb, to 1 m high. 2400 m (R. W. J. KEAY & J. S. LIGHTBODY FHI 28494, K). Bamenda Station, 1650 m (MAITLAND 1614, K). Cameroon Mt., 1950 m (MAITLAND 825, K), ibidem 2000 m (DUNLAP 46, K), ibidem 2350 m (MANN 1235, 1990, K), ibidem, Nyango Camp, 2500 m (MAITLAND 967, K).

Uganda.

Budadiri, Bugishu, 1450 m (CHANDLER 441, K). Budongo Forest (EGGELING 2113, BR), ibidem, swamps (EGGELING 2113, K). Bulambuli, Bugishu, rough pasture, bamboo zone (THOMAS 566, K). Bulambuli, Mt. Elgon 3000 m (TOTHILL 2304, K). Kachwekano Farm, Kigezi, Grassland, 2250 m. Erect herb to 3 ft. high (J. W. PURSEGLOVE 3006, K). Namanve, Mengo, 1250 m (EGGELING 1528, K). Ruwenzori, Kivata in Toro-Distr. 1600—2300 m (SCOTT ELLIOTT 7699, K). Namamve, Mengo, 3700 ft. (EGGELING 1528, BM).

Kenya.

Aberdare Mts. (EVAN JAMES s.n., K). Elgeyo (BRODHURST HILL 242, K). Mt. Elgon, 2850 m (LUGARD 266, BM, K), 3000 m (GRANVIK 123, PRE, W, S).

Mt. Elgon, River Rougai, 2500 m (LINDBLOM s.n., S). Prope Forest Station, 2300 m, in silva montana ad rivulum (R. E. & TH. C. E. FRIES 583, BM, K, S, UPS, BR). Mt. Kenya, 3000 m, below bamboo zone and slightly into bamboo mixed forest (GEDGE 6701, BM, K). Limuru, 2700 m (R. W. MÉTTAM 257, K). Thompson's Falls distr., 2600 m (PIERCE 1462, BM, K). Between Kibwezi and Machakos, 1100—2000 m (SCOTT ELLIOTT 6692, K). Massai-Land: Leikipa, Rangatan Udari (J. W. GREGORY s.n., BM).

»Kenya» Tiuderet Farm (DAVOLI 37, FI; METTAM 257, K); Kenia, Nieri in humidis (T. C. E. FRIES 105, BR).

Tanganyika.

Kibosho, Moshi Distr., 1300—1650 m (HAARER s.n., K). Kilimanjaro, 2000 m (JOHNSTON s.n., BM, K), ibidem 2900 m, Kili-Wald (GELINGER 4394, K), ibidem, SO-Seite, 2700 m, untere Grenze des Gürtelwaldes, Bismarckhöhe, 1 m, sehr häufig (SCHLIEBEN 4574, BR, BM, S). W-Meru, Arusha, Ngare Olmotoni, 1650 m (HAARER 6127, K), Nyashozi, Karagwe, Bukoba Distr., 1650 m (HAARER 2392, K). Oldeani Mt., Mbulu Distr., 1650—2000 m (ST. CLAIR-THOMPSON, S). Mbeye, Poroto Mts., Tukuyu Distr., 1850—3350 m (ST. CLAIR-THOMPSON 820, K). Uluguru, Bunduki, 1500 m (BRUCE 591, BM, K). Kilimanjaro, Bismarck Hill, 8500 ft. On the edges of secondary bush in a cleared area of *Podocarpus-Hagenia abyssinica* forest. Fairly common (GREENWAY 3860, K). Kilimanjaro, Wissensch. Station, 1550 m (G. VOLKENS 676, BM).

Belg. Congo.

Blukewa (CLAESSENS 1360, BR). Djugu (Kibali-Ituri), 1780 m (LEBRUN 3884, S). Katana Kivu, Lushasha, 2000 m, Kabera (DE WULF 51, BR). Kipiri, Marungu, ferme Vandenbrande, 2000 m (QUARRÉ 7305, BR). Kitega, dans les anciennes cultures (ELSKENS 224, BR). Lubero, Rutshuru (GHESQUIÈRE 3534, 4345, BR, K). Lulenga (VAN DEN HONDT, s.n., BR). Mobenga, pied du Ruwenzori, 1100—1300 m (BEQUAERT 3501, BR). Mukule, Steppe à *Acanthus* (BEQUAERT 5905, BR, Typus). Park Nation Alb., Versant S. du Mikeno, 2270 m forêt de montagne (LEBRUN 7275, S). Route de Kilo à Chari (CLAESSENS 1360, BR). Ruanda: Shyorvugi, Bumbago, Kigan, 1800 m, jachères, cultures (BECQUET 772, BR), Buliza, Kigali, 1700—1900 m, savane herbeuse, jachères (BECQUET 226, BR, K). Rutshuru, Mt. Katala, 1500—1700 m (LEBRUN 9150, BR, K). Virunga Vulk. Geb., Kumatumba (DE WITTE 1599, S). Wimbi, à 26 km au Sud de Luboro, 2200 m, horizon sup. de la forêt de montagne, au bord d'un ruisseau, herbe, 1 1/2 m (LOUIS 4646, BR). Kikomero, 1850 m (J. LEBRUN 8465, BR). Montagnes à l'Ouest du Lac Kivu, à l'Ouest de Tshibinda (H. HUMBERT 7567, BR), Montagnes à l'Ouest du Lac Kivu, 2000 m (H. HUMBERT 7828, BR). Environs d'Elisabethville (P. QUARRE 4734, BR, K). Katanga, Kafubu (QUARRE 845, BR). Katanga, 5 km of Elisabethville (QUARRE 1909, Br).

Southern Rhodesia.

Rhodesia austr.: Inyanga distr. in monte Inyangani ad rivulum, ca. 2000 m (T. NORLINDH & H. WEIMARCK 5090, LD). Inyanga, Pungwe Source (?), by stream, 6500 ft. (WILD 1418, SAL.).

Transvaal.

Distr. Pretoria, Fountains Valley, near river banks, common (REPTON 713, PRE).

Madagascar.

»Madagaskar» (GAILLARDOT 70, P). Centr. Madagaskar (BARON 1856, 2702, 3312, 393, BM, FI). Ost-Imerina, Andragoloaka (HILDEBRANDT 3646, G, K). Ambohimitombo forest, 1440 m (FORSYTH MAJOR 369, G, K). Between Kahn-draka and Ambohimitombo (F. TH. 707, BR, K). Sambirano (HUMBERT 18550, P). Andohakelo (HUMBERT 6127, P). Massiv du Beampingarata (HUMBERT 6344, P). Valle de Rahonela (HUMBERT 6127, P). Anaratra (HUMBERT 4542, P). Tsaratanana (PERRIER 8563, P). Ambositra (DECARY 13527, P). Environs de Tananarive (BOJER s.n., WATERLOT 620, D'ALLEIZETTE s.n.).

When describing *R. camptodon* in 1932 I was not aware of DE WILDEMAN's description of *R. Bequaertii* and *R. Quarrei* (1929). Judging from the type specimens and the original descriptions before me, it is clear that these three species are alike in most respects, e.g. in the narrow thin leaves cuneate at base, long slender branches, narrow acutely triangular-lingulate valves and numerous long hooked teeth of valves. They disagree only regarding the callosities on the valves. In *R. Bequaertii* no callosity at all is developed, in *R. camptodon* one valve has a conspicuous callosity, the others have only a small one or just a swollen midrib and in *R. Quarrei* all valves bear nearly equally developed conspicuous callosities. As this character is not correlated to any other characters nor limited to any special area, I think that ROBYNS is right in regarding *Quarrei* as a variety only. This view is strengthened by the intermediate position of *R. camptodon* as to this character.

As I have pointed out in Beih. Bot. Centrbl. 49, 2: 77 (1932) when discussing this plant under the name of *R. camptodon*, it is most closely related to *R. Steudelii* and *R. nepalensis*. For further details on the variability and geographical distribution of these species see RECH. FIL. l.c. and in Candollea 12: 112—115 (1949). Until recently *R. Steudelii* and *R. Bequaertii* have been treated in most publications on the African flora under the name of *R. nepalensis* SPR. DE WILDEMAN in his discussion of *R. Bequaertii* and *R. Quarrei* has pointed out that the main difference between his new species and *R. nepalensis* lies in the lower leaves being cordate or rounded at the base in *R. nepalensis* and cuneate in *R. Bequaertii*. This is certainly correct but there are still other and apparently more important characters separating these species, especially in the size and shape of the valves. Still closer are the similarities between *R. Bequaertii* s.l. and *R. Steudelii*, which

were not mentioned by DE WILDEMAN but which I stressed in describing *R. camptodon*. Comparison is facilitated by the following tabulation:

Subsect. *Hamati*. Valvarum dentes apice hamato-incurvi.

	<i>R. nepalensis</i>	<i>R. Steudelii</i>	<i>R. Bequaertii</i>
Folia basalia et caulina inferiora:	latitudine ± duplo longiora basi semper cordata.	latitudine 3—5-plo longiora basi truncata v. cuneata (raro cordata).	latitudine (5—) 7—8 (—9) plo longiora basi cuneata.
Valvae:	± 6 mm longae ambitu ovato-triangulares. unica (rarius omnes) callum rotundatum vel ovatum ferens.	± 5 mm longae ambitu oblongo-triangularis. unica tantum callum angustum ferens.	3—4 (—4.5) mm lg. ambitu anguste triangulares. nervus medianus incrassatus non vel indistincte callifer (vel callum rotundato-ovatum ferens: var. <i>Quarrei</i>).
Nux:	± 4 mm longa	± 3 mm longa	2—2.5 (—3) mm longa

The hooked teeth of the valves in this group of species are a character found again in *R. Brownii* CAMPD. occurring in Australia and Indonesia. An additional similarity is the tendency of *R. Bequaertii* and *R. Brownii* to develop axillary serotinous branches from the lower nodes of the stem. These two fundamental facts seem to indicate a certain relationship between *R. Brownii* and the Subsect. *Hamati* as accepted by me in »*Rumices Asiatici*» in *Candollea* 12: 112 (1949). *R. Brownii* is however to be distinguished at first glance from all other species of the genus by the top of the valves ending in a hooked tooth similar to the lateral ones.

Variation in *R. Bequaertii*, in addition to the varying development of callosities of the valves discussed above, is considerable. Dwarf stout specimens, such as are observed occasionally in *R. Steudelii*, do not occur. Height of stem varies between about 80 cm and 1.50 m, occasionally 2 m. The basal and lower leaves are normally about 4—7 (—9) times as long as broad, their base always cuneate, their texture often remarkably thin when dried, thinner than in related species, and the side nerves are very fine and numerous. Occasionally there occur spe-

cimens with short and relatively broad leaves, which however can be separated easily by their size and shape from *R. Steudelii*.

The differences indicated in »Vorarbeiten I» between *R. Bequaertii* (= *R. camptodon*) and *R. Steudelii* have been confirmed by studying much more ample material. Only the form of callosity varies slightly as well as the leaf-shape, e.g. MANN 1235, MAITLAND, DUNLOP 46. For most of the specimens the proportions originally described remain correct. The leaves of a few specimens, e.g. VOLKENS 676 and SWYNNERTON 1345, are broader and shorter. In these cases the fruit characters are decisive for placing them under *R. Bequaertii*.

When describing *R. camptodon* in 1932 I did not indicate any of the cited specimens as the type, but in fact the description was based essentially on the Madagascar specimens (HILDEBRANDT 3646, FORSYTH MAJOR 369, GOUDOT s.n.).

R. Bequaertii DE WILDEM. var. *Quarrei* (DE WILD.) ROBYNS, Fl. Parc Nation. Alb. 1: 117 (1948).

Syn.: *R. Quarrei* DE WILDEM., Pl. Bequaert. 5: 3 (1929).

Differt a typo valvis omnibus (rarius unica tantum) calliferis.

Ethiopia.

Galla Sidamo: Terr. dei Borana, Arero (Meta-Gafersa), 1650 m, nell'acqua (CUFODONTIS 375, FI). Galla Arussi: Sponda orientale del lago Zuai, 1500 m (NEGRI 102, FI).

Uganda.

Bwamba, 800 m (FYFFE 37, K). Entebbe (FYFFE 242, K). Toro, Inwenge (SNOWDEN 72, BM, K). Fort Portal, Toro (HAZEL 30, K). Mile 15 Entebbe Road, 1200—1300 m (CHANDLER-HANCOCK 1698, K). Mabira Forest, near Mubango, 1350 m (DÜMMER 3101, K). Masaka, Buganda, Buddu, 1250 m, Malabigambo Forest near Katera (H. C. DAWKINS 619, K). Victoria Nyanza region (MAITLAND 191, K). Mabira Forest (MAITLAND 325, K).

Kenya.

Nairobi, stream edge among *Papyrus*, 1800 m (DÜMMER 1603, 1942, BM, K). Nieri, loco humido (R. E. & TH. C. FRIES 64, 105, K, UPS).

Tanganyika.

Bagamoyo, Nguru Gebirge, ca. 6° s. Br., 130 km von der Küste, Savannen-
hügel, 1500 m, Maskat, kleiner Bach (SCHLIEBEN 4159, BM, S). Robeho Mts.,
in Uagara, 1550 m (SPEKE & GRANT s.n., K). Kilimanjaro, 1000 ft., forest
zone (SWYNNERTON 1345, BM). Nyangozi, Karagwe, Bukoba Distr. 1650 m
(HARRER 2392, K).



Fig. 9. *Rumex Bequaertii* DE WILDEM. var. *Quarrei* (DE WILDEM.) ROBYNS. Typus.

Belg. Congo.

Elisabethville (DE GIORGI s.n.; P. P. SALESIENS 181, BR). Kafubu (QUARRÉ 269, BR, Typus). Vallée de la Karavia (QUARRÉ 3575, K, BR). Parc Nation. Albert, Mushumangabo, 2075 m, bord du marais (LEBRUN 7128, BR), Mushumangabo entre le Mikeno et le Nyamuragira, 1950 m, bord du marais (LOUIS 5483, BR). Ruwenzori, Riv. Lume, 2000 m (MICHOT 17, BR). Muwendula, versant du Congo, 1850 m, forêt (SCAETTA 746, BR). Elisabethville (J. BURTT-DAY 17967, BM). Ruwenzori, Heath Forest (E. et C. GODMAN 302, BM). Ruwenzori, 7000 ft. (A. F. R. WALLASTON, BM). Kigali, Ruanda (BASQUAT 226, K).

Nyasaland.

Cholo Mountain, Cholo Distr., 1200 m, perenn. herb about 1 m high (L. J. BRASS 17820, K, NY). Nyika Mts., 1400—2000 m (WHYTE s.n., K). »Nyasaland» (BUCHANAN 513, 552, BM, G, K; SMUTS 2292, PRE). Shire Highlands (BUCHANAN 77, K).

Angola.

Distr. do Cuanza-Sul, Seles prope flumen, Cambongo (Gunza) et Quéve (Cuvo), 1000 m (GOSSWEILER 9316, BM, K).

Madagascar.

Ankafana, Savaravina (W. DEAVES COWAN s.n., BM). Antsirabe (HUMBERT 1300, P). Ambatondrazaka (COURS 731, P).

Subsect. h. *Dentati*.

RECH. FIL. in Field Mus. Bot. 17, no. 1: 8 (1937).

Annui (vel biennes?). Folia inferiora basi leviter cordata vel rotundata vel late cuneata, in vel supra medium latissima, latitudine 2 (3)-plo longiores. Valvae saepius dentatae, maiusculae, ultra 3.5 mm longae saepius omnes calliferae.

43. *Rumex dentatus* L.

L., Mant. 11: 226 (1771); CAMPD., Monogr. Rum. 81 (1819), s.l.; RECH. F., Beih. Bot. Centrbl. 49/2: 12 (1932).

Syn.: *R. strictus* LINK, Enum. hort. Berol. 350 (1821).

R. foveolatus HOCHST. in LORENT, Wanderungen im Orient (ex Flora 1845: 26 (1845)).

Annuus (vel interdum biennis?). *Caulis* 0.2—0.7 m altus, simplex vel subsimplex vel ramosus, rami breves vel elongati, erecti vel erecto-patentes vel rarius arcuato-divaricati, nunquam refracti vel intricati. *Folia basalia* e basi truncata rarius subcordata vel angustata oblonga vel ovato-oblonga, infra medium saepe sed non semper panduriformi-contracta, apice obtusa vel acutiuscula, plana vel margine crispata, latitudine 2—3-plo longiora, parva, petiolata, petiolo lamina breviora vel aequilonga. *Folia caulina* inferiora basi subcordata vel truncata vel angustata oblonga vel ovata vel elliptico-lanceolata, plana vel crispa, acuta, petiolata, petiolo lamina breviora. *Florum glomeruli* plerumque omnes remoti, rarius summi \pm contigui, omnes foliis lanceolatis sursum decrescentibus suffulti; folia summa glomerulos non superantia. *Pedicelli* fructiferi perigonio plerumque paulo longiores sat validi rigiduli, sed quam in *R. pulchro* semper minus crassi, prope basin articulati, perigonium versus sensim dilatati vel ad basin perigonii subnodoso-incrassati. *Perigonii foliola exteriora* dimidiam latitudinem valvae aequantia vel paulo superantia. *Valvae* forma et magnitudine valde variabiles, integrae vel subintegrae vel vario modo dentatae (vide clavam subspecierum), 3.5—5 mm longae, 2—3 mm latae, faciebus in subspeciebus pluribus reticulato-nervosae, omnes inaequaliter vel subaequaliter, rarius una tantum calliferae. *Nux* 2—2.75 mm longa, paulo infra medium latissima.

Distr.geogr.: Per Asiam tropicam et subtropicam usque in Europam austro-

orientalem et Africam borealem dispersus. — Tabulam geographicam vide RECH. F., Beih. Bot. Centrbl. 49/2: 129 (1932).

Rumex dentatus L. ssp. *callosissimus* (MEISN.) RECH. F.

RECH. F. in B.B.C. 49/2: 13 (1932).

Syn.: *R. callosissimus* MEISN., DC. Prodr. 14: 57 (1854).

R. dentatus L., Mant. II: 226 (1771) s.str.; MUSCHLER, Man. Fl. of Eg. 1: 259 (1912).

R. dentatus β DANSER in schedis; conf. Nederl. Kruidk. Arch. 1921: 222 (1922) et 1925: 437 (1926).

Annuus vel biennis. Irramosus vel saepius ramosus. *Florum glomeruli* inferiores remoti, superiores contigui, saepe omnes foliati. *Folia inferiora* basi truncata vel subcordata, panduriformi-contracta, sat longa; superiora lanceolata, acuta, undulata; pedunculus dimidiam longitudinem laminae aequans. *Pedicelli* fructiferi sat validi, ± 4 mm longi, prope basin articulati, apice saepe nodoso-incrassati. *Valvae* fructiferae 3—4 mm longae, ad summum 2 mm latae, acutae, omnes calliferae. *Calli* crassi, globosi, totam vel fere totam faciem valvarum occupantes. *Valvae* integerrimae (f. *integerrimus* Rech. f.) vel saepius utrinque pluridentatae (f. *pluridentatus* Rech. f.), dentes basi non dilatati, sat validi, longitudine valde variabiles.

Egypt.

Balbeis, Basse Egypte (W. BARBEY 776, Br, ZT); Cairo (SAMARITANI s.n., S, G. SCHWEINFURTH s.n., Br); Girghe (SIEBER s.n., Br, S); Gizeh (GUNNAR V. FRENCKELL s.n., S); Berges du Nil pres de Madfouneh (KRALIK s.n., S); Mariut: Masraf Khershid, rice fields (M. A. MUSTAFA & Y. S. SABET s.n., S); Nilinsel oberhalb Giseh (G. SCHWEINFURTH s.n., Br); Sur les bords du Nil (BOVÉ s.n., Br); Nildelta (D. FIGARI s.n., FI); Oahira (G. CH. EHRENBERG s.n., B, Br).

Icon: RECH. F., Beih. Bot. Centrbl. 49/2: tab. 1, fig. 1 (f. *pluridentatus*) et fig. 2 (f. *integerrimus*).

Distr.geogr.: Mesopotamia (raro), Syria, Palaestina, Aegyptus. Passim in Europam occidentalem introductus.

Rumex dentatus L. ssp. *mesopotamicus* RECH. F.

RECH. F. in Beih. Bot. Centrbl. 49/2: 15 (1932).

Syn.: *R. dentatus* L., var. *pleiodon* BOISS., Fl. or. 4: 1013 (1879), p.p.

R. pulcher var. *macrodon* HAUSSKN., Mitt. Thür. Bot. Ver., N.F., 1: 34 (1891) et 11: 59 (1897).

Annuus vel biennis. Strictus, saepe irramosus. *Florum glomeruli* plerumque omnes remoti, infimi tantum foliati. *Folia* lineari-lanceolata vel anguste ovata, interdum panduriformi-contracta basi plerumque

angustata vel rarius truncata, plana, sat brevia. *Pedicelli* fructiferi valvis aequilongi vel sesqui — raro fere duplo — longiores, sat validi. *Valvae* fructiferae 4 $\frac{1}{2}$ —5 mm longae, 3 mm latae, acutae, omnes aequaliter calliferae, margine utrinque dentibus compluribus, basi non dilatatis usque ad 4 mm longis validis ornatae. In utroque latere calli 1(—2) maculae nervaturae crassae.

Egypt.

Suez, in Kleekulturen (J. M. HILDEBRANDT s.n., BM); Alexandria (LETOURNEUX s.n., E); Rhauseis (J. BALL s.n., E); Gize (BORNMÜLLER 10967, E); Zagazig (J. BALL s.n., E); Barrage, near the old station (G. TÄCKHOLM s.n., S.).

Lybia.

Tenidah an Gräben in Geio Ten (P. ASCHERSON 2161, LD).

Tunis.

Tunetia media: Dar Farik prope Kairouan, in humidis (MURBECK s.n., LD).

Icon: RECH. F., Beih. Bot. Centrbl. 49/2: tab. 1, fig. 6 (1932).

Distr.geogr.: Persia australis, Mesopotamia, Syria, Palaestina, Ins. Cyprus, Aegyptus. Raro introductus in Europam borealem et occidentalem.

Subsect. i. Maritimi.

RECH. FIL. in Field Mus. Bot. 17, no. 1: 8 (1937).

Annui (vel biennes?). Folia inferiora basi cuneata vel truncata rarius subcordata, latitudine 2—6-plo longiora, plana vel crispata. Valvae minutae, rarissime ultra 3 mm longae, in plurimis speciebus dentibus tenuissime setaceis longis provisae.

44. *Rumex palustris* SM.

SM., Fl. brit.: 394 (1800); CAMPD. Mon. Rum. 63 et 78 (1819); MEISN. ap. DC. Prodr. 14: 59 (1856); MURBECK in Bot. Notis. 1913: 201 (1913).

R. conglomeratus × *maritimus* G. F. W. MEYER Fl. Hannov. 470 (1849); HAUSSKN. in Mitt. geogr. Ges. Thür. 3: 69 (1884); BECK Fl. Nied. Österr. 319 (1890—93); BECK in Reichb. Icon. 24: 43 (1909), p.p.; ASCHERS. & GRAEBN. Synops. 4: 756 (1912), p.p.

R. maritimus var. *paluster* ASCHERS. Fl. Prov. Brandbg. 581 (1864).

R. maritimus var. *limosus* ČELAK. Prodr. Fl. Böhm. 158 (1871).

R. limosus MURBECK in Bot. Notis. 1899: 33 (1899) et auct. vix THUILL. Fl. Env. Paris ed. 2: 182 (1799).

R. Samuelssonii RECH. FIL. in Fedde Repert. 39: 169 (1936).

Annuus vel biennis. *Caulis* stricte erectus, canaliculato-sulcatus, 40—50 cm altus, brunneo-rufescens, in tertia circiter parte superiore ramosus et fructifer. *Folia basalia* lanceolata, utrinque attenuata, latitudine

usque 6-plo longiora. Folia caulina inferiora oblongo-lanceolata 10—12 cm longa, et 2—8 cm lata, in medio circiter latissima basin versus sensim longe attenuata deinde abrupte contracta, apicem versus sensim longe attenuata apice acuta; lamina plana sed extremo margine tenuissime crenulato-crispata, utrinque glabra et laevis, nervis secundariis angulo ca. 60° a costa mediana abeuntibus. Petiolus latitudinem laminae aequans vel superans. *Folia caulina* superiora sensim breviora et brevius petiolata praecipue autem angustiora, latitudine ca. 8-plo longiora. *Rami* floriferi singuli simplices angulo acuto arcuato-divergentes paniculam subapertam formantes. *Florum glomeruli* multiflori inferiores remoti superiores contigui omnes foliis anguste linearibus suffulti. *Pedicelli* fructiferi rigiduli prope basin distincte annulato-articulati, basin perigonii versus paulo dilatati, perigonium longitudine aequantes vel eo ad summum sesquolongiores. *Perigonii foliola exteriora* lineari-lanceolata, 1.5 mm longa, dimidiam latitudinem valvarum superantia, basibus valvarum appressa dorso carinata, apice antrorsa. *Valvae* fructiferae 3 mm longae, prope basin dentibus exceptis 1.2—1.5 mm latae, ambitu anguste linguiformes, apice valde attenuatae sed obtusiusculae, utrinque in dentes basi dilatatos 2—3 subulatos patentes latitudinem valvae aequantes vel rarius superantes excurrentes, nervatura indistincte reticulato-nervosa maculis in utroque latere calli 1—2. *Valvae* omnes subaequaliter calliferae callo oblongo apice obtuso flavo brunnescente 1.6 mm longo. *Nux* brunnea 1.8—2 mm longa, vix infra medium latissima.

Icon: Fl. Dan. Tab. 1873.

Distr.geogr.: Europa fere omnis regione boreali excepta. In regione mediterranea rarus. Africa borealis, in Marocco rarissimus. Ex Asia e Syria tantum notus.

Morocco.

In humidis, prope El Araix, l. El Guedira dicto (FONT QUER 162, BM, S).

This species, so far as I know, was first reported from the African Continent by MAIRE in Cavanillesia 6: 20 (1933). The plant has been distributed by FONT QUER under the name of *R. maritimus*. Its differences from that species have been pointed out by MURBECK (1913); the easiest distinguishing character lies in the valves, which are ± 3 mm long with obtuse callosities in *R. palustris* and ± 2.5 mm long with acute callosities in *R. maritimus* L.

45. *Rumex aegyptiacus* L.

L., Sp. Plant. ed. I, 335 (1753); CAMPD., Monogr. Rumex 63, 74 (1819), p.p., quoad pl. aegyptiacam. Syn.: *R. comosus* FORSK., Fl. Aegypt. Arab. Cent. III., 76 (1775); MEISN. ap. DC., Prodr. 14: 61 (1856), incl. *a subacaulis* and *β caulescens*.

Annuus, humilis, a basi in ramos plures 1—15 cm longos saepius validos, procumbentes vel ascendentes, a basi fructiferos divisus; rami fructiferi columnares compacti, fructibus contigue intertextis ± 15 mm crassi, tota longitudine copiose foliosi. Rami rubescentes, sulcato-striati, saepe fructibus omnino occulti, interdum tota planta fructifera caespitem minutum compactum 1—4 cm diametro formans. *Folia* omnia longissime petiolata, basalia et caulina inferiora mox marcescentia sed petioli 3—6 cm longi diutius persistentes. Folia caulina linearia usque lineari-lanceolata, 3—10 cm longa, 5—18 mm lata, basi late usque anguste cuneata, apice acuta, glabra, laevia, margine \pm crispata, saepe supra medium latiora, consistentia \pm crasse membranacea, nervis lateralibus tenuibus numerosis angulo $\pm 45^\circ$ a costa mediana abeuntibus, omnia inflorescentias longe superantia. Verticillastri multiflori. *Pedicelli* fructiferi brevissimi, crassi, perigonio breviores vel eum raro aequantes, prope medium articulati, basin perigonii versus subnodoso-incrassati. *Perigonii foliola exteriora* lanceolata acutiuscula dimidia valvae latitudine paulo longiora. *Valvae* apice subulata exclusa ± 2.5 mm longae, ± 1.5 mm latae, lingulatae, basi attenuatae, apice in dentem subulato-setiferum sensim attenuatae, dentibus lateralibus plerumque utrinque 2 setiformes valvae latitudine ± 4 -plo longioribus. Valva anterior callum crassissimum ellipsoideum totam valvae superficiem occupantem valde prominentem aurantiacum antice rotundatum proferens; valvae ceterae saepissime ecallosae. Consistentia valvarum rigida subcoriacea; nervatura saepe \pm indistincta, nervis saepe binis quoque in dentem excurrentibus. *Nux* matura brunnea, ca. 1.5 mm longa, sublenticulari-applanata, utrinque brevissime subaequaliter attenuata.

Egypt.

Le Caire, Genizeh (PEYRON s.n., G (Hb. Del.)). Caire, bords du Nil (BOVÉ s.n., P). Fezoreh prope Le Caire (SICKENBERGER 142, Z). Bords du Nil à Kasr-el-Aint près de Caire (BURDET 433, G (Hb. Del.)). Kairo: In palmetis ad El-Marg (BOISSIER 10965, G (Hb. BOISS.)) Kairo: Ad deserti marginem prope Turra (BOISS. 10966, G (Hb. BOISS.)). Giza: On banks of Nile (A. M. GREISS s.n., S). Gize-Pyramiden (KNEUCKER s.n., G (Hb. BOISS.)). Bords du Nile près de Madfouneh (KRALIK s.n., G (Hb. DEL.)). Kanalränder östlich Medinah (ASCHERSON 461, G (Hb. BOISS.)). Nordufer des Mokamosees in El

Wady (SCHWEINFURTH 675, G (Hb. DEL.)). Ad ripas Nili (BOSSIER s.n., G (Hb. DEL., BOISS.)). Girghe (SIEBER s.n., P, S, G (Hb. DEL., BOISS.)), CL, NY). Banks of Nil near Assut (POST s.n., Z). Niltal (FIGARI s.n., FI).

R. aegyptiacus has been redescribed by FORSKÅL as *R. comosus* because the flowers are sometimes not trimerous but dimerous; FORSKÅL mentions also 5- and 7-merous flowers. This tendency is indeed more frequent in *R. aegyptiacus* than in other *Lapatha* and is perhaps connected with the extremely dense inflorescence. While this must be regarded as a potential character, its irregular occurrence does not encourage its taxonomic recognition.

R. aegyptiacus has been confused with *R. Marshallianus* RCHB. growing in European Russia and Siberia (see RECH. F. Candollea 12: 137 (1949)). *R. Marshallianus* differs from it by having a much less compact fruiting panicle, shorter teeth on the valves and longer thinner pedicels. *R. aegyptiacus* varies to a certain degree in height, but there is absolutely no basis for distinguishing varieties as proposed by MEISNER.

46. *Rumex garipensis* MEISN.

MEISN., Linnaea 14: 491 (1840) incl. var. *elatus* et *humilis*; MEISN. ap. DC., Prodr. 14: 60 (1856); WRIGHT in Fl. Capens. 5, 1: 474 (1912).

Radix annua. *Caulis* tenuis, flexuosus, ascendens vel decumbens, rarius e basi arcuata suberectus, saepissime a basi in ramos tenues flexuosos arcuato-ascendentes divisus, 6—25 cm longus, brunneus vel purpurascens, tenuiter sulcato-striatus, ut rami saepe a basi fere fructifer. *Folia* basalia petiolo ad 6 cm longo suffulta. Folia omnia consistentia in sicco tenuiter membranacea saturate viridia glabra, laevia, nervis secundariis numerosis angulo $\pm 45^\circ$ a costa mediana abeuntibus tenuiter reticulato-anastomosantibus. Lamina foliorum basaliū ad summum 12 cm longa, 4 cm lata, sed saepe multo minor, basi truncato-subcordata, supra basin interdum paulo panduriformi-contracta, margine \pm , interdum intense crispata, apice acuta. Folia caulina omnia longiuscule petiolata, omnia verticillastra fulcrantia, verticillastrī diametro longiora, superiora paulatim decrescentia, proportione angustiora, latitudine usque 8-plo longiora, basi \pm anguste cuneata, margine saepe valde crispata. Florum glomeruli omnes remoti, omnes foliis suffulti, multiflori. *Pedicelli* fructiferi prope basin distincte articulati, basin perigonii versus sensim incrassati, quam valvae usque sequilongiores. *Perigonii foliola exteriora* lanceolata acuta, basibus valvarum appressa, earumque dimidiam latitudinem (dentibus valvarum exclusis) plerum-

que paulo superantia. *Valvae* apice subulata exclusa 2.5—3 mm longae, 1.5(—2) mm latae, subscutiformes, basi plerumque \pm attenuatae, apice in dentem subulato-filiformem valvae longitudine saepe longiorem excurrentes, dentibus lateralibus \pm 3, filiformi-subulatis valvae latitudine 2- fere 4-plo longioribus. Valva anterior caeteris saepe submaior, callum ellipsoideum aurantiacum antice obtusum valde prominentem proferens. Valvae ceterae callum minutum ferentes vel ecallosae. Consistentia valvarum rigidule membranacea, nervatura \pm interdum indistincta, nervis saepe 2(—3)-nis quoque in dentem excurrentibus. *Nux* matura brunnea, 1.2—1.5 mm longa, 0.7—0.9 mm lata, infra medium latissima.

Cape Province.

In umbra *Salicum* ad ripam flum. Garip (Orange River) prope Kuigunjels, infra 1000 ped. (DRÈGE s.n., Type of *R. garipensis* var. *elatus*, NY). Ad ostium flumen Garip (Orange River) (DRÈGE s.n., Type of *R. garipensis* var. *humilis*, NY). Zwischen Verleptpram und der Mündung des Garip (Orange River), unter 1000 Fuss (J. F. DRÈGE s.n., S). Garip (Orange River), auf der Fläche und auf Hügeln bei der Mündung des Flusses, unter 600 Fuss (J. F. DRÈGE s.n., S). Between Verleptpram and the Mouth of the Orange-River (DRÈGE s.n., K).

As far as I know, *R. garipensis* has not been recollected since it was originally found by DRÈGE in 1839. This species is very similar to *R. aegyptiacus* from Egypt and particularly to *R. Marschallianus* RCHB. from European Russia and Siberia. This Cape plant is so similar to the Russian one that if both occurred in the same region they would scarcely be specifically separable. The fruiting whorls of *R. Marschallianus* are usually more contiguous in the upper part of inflorescence; the lower leaves are never so broad as they sometimes are in *R. garipensis*; and slight differences occur in the outline and nervation of valves. The callosities are narrower and the nut is broadest near the middle in *R. Marschallianus*. MEISNER's varieties *elatus* and *humilis* of *R. garipensis* do not deserve taxonomic status as far as I can judge from the few dried specimens I have seen.

Subgen. IV. *Platypodium* (Willk.) Rech. f.

WILLK. in WILLK. & LANGE, Prodr. Fl. hisp. 1: 284 (1861 pro sect.). Sect. *Heterolapathum* NYMAN, Consp. Fl. europ. 0: 635 (1882).

Annui raro perennantes, uni- vel pluricaules, caulibus gracilibus humilibus, simplicibus vel basi ramosis. Folia basalia rosulantia minutissima ad 2 cm longa, ovata vel spathulata. Florum glomeruli pauciflori, flori-

bus (1—)2—3(—4). Flores saepe dimorphi. Valvae fructiferae minutae, saepius dentatae, callis minutissimis reflexis provisae. Pedicelli fructiferi in una eademque planta saepe vario modo evoluti, pro parte breves, pro parte elongati clavati vel inflato-applanati, quam perigonii foliola exteriora reflexa saepe multo latiores.

47. *Rumex bucephalophorus* L.

L., Spec. pl. ed. 1: 386 (1753).

Lapathum bucephalophorum LAM., Fl. Franc. 37 (1778).

Rumex membranaceus POIR., Voy. Barb. 2: 155 (1789).

Acetosa bucephalophora POURR., Ann. Soc. Linn. Lyon., N.S. 17: 145 (1869).

Bucephalophora aculeata PAU, Not. Fl. Espan. 1: 24 (1887).

? *Rumex aculeatus* L., Syst. ed. 1: 991 (1758—59). RECH. F., Bot. Notis. 1939: 491 (1939).

Annus (in regione medit. orient.) raro perennans (in reg. med. occid. et in Macaronesia). *Caules* singuli simplices erecti validi vel plures ascendentes tenues. *Folia basalia* ovata ovato-lanceolata vel subcircularia, saepe spathulata obtusa, rarius acutiuscula, parva, numerosa vel pauca, petiolo laminam \pm aequante usque triplo longiore. *Folia caulina* sensim angustiora acutiora brevius petiolata. *Flores* (1—)2—3(—4) in ochrearum axillis, racemoso- vel subspicato-dispositi, paulum remoti vel \pm conferti, saepe dimorphi (vide subspecies), *pedicellis* aut brevibus crassiusculis teretibus in vel paulo infra medium articulatis, aut elongatis clavato-dilatatis \pm applanatis interdum eximie curvatis prope basin articulatis quam perigonia pluries longioribus et interdum latioribus. *Perigonii foliola exteriora* lineari-lanceolata, minuta, semper refracta. *Valvae* fructiferae magnitudine forma et denticulatione valde variabiles (vide subspecies), prope basin callum reflexum minutissimum \pm applanatum ferentes. *Nux* 1.3—2.3 mm longa.

Distr.geogr.: Regio mediterranea.

Rumex bucephalophorus L. ssp. *Hipporegii* (STEINH.) RECH. F.

RECH. F. in Bot. Notis. 1939: 491 (1939).

R. bucephalophorus L. var. *Hipporegii* STEINH., Ann. Sc. Nat., ser. 2, 9: 201 (1838), saltem p.p., synonymo *R. aculeati* L. probabiliter excluso; MURBECK, Act. Reg. Soc. Phys. Lund 10: 9 (1899).

R. bucephalophorus L. var. *uncinatus* BOISS., Fl. or. 4: 105 (1879) p.p.

R. platycarpus BATTAND. in BATTAND. & TRAB., Fl. de l'Algerie 774 (1890) fide MURB.

R. bucephalophorus L. var. *aculeatus* GÜRCKE in RICHTER-GÜRCKE, Pl. Europ. 2: 104 (1887).

Icon.: RECH. F., l.c. 495 (fig. 2, 1).

Annuus. *Caulis* simplex vel prope basin \pm ramosus, strictus vel e basi arcuata stricte erectus, rarius caules plures arcuati. *Folia basalia* pauca, ovata, maiuscula, mox emarcida, petiolo lamina usque duplo longiore. *E collo radice nunquam flores emittens*. *Flores* omnes aequales et aequaliter fructiferi, magni 2(—2.8) mm longi, plerumque terni, aut pedicellis omnibus brevibus non incrassatis, aut in media inflorescentia pedicellis nonnullis elongatis clavato-inflatis applanatis, incurvis. *Valvae* fructiferae triangulares, acutae, 3.5—5 mm longae, dentibus utrinque 2—3 basi valde dilatatis, valde arcuato-divaricatis, validissimis, basalibus latitudinem valvae usque duplo superantibus. Nervatura valvarum interdum indistincta. *Valvae* prope basin callum parvum subreflexum ferentes. *Nux* crassiuscula, \pm 2.3 mm longa.

Distr.geogr.: Asia anterior (Cilicia, Syria, Palaestina, Transjordanica), Africa borealis (Tripolitania, Tunetia, Algeria).

Tab. geogr.: RECH. F., l.c. 493 (fig. 1).

As to localities see RECH. F., l.c. 492.

Rumex bucephalophorus L. ssp. *aegaeus* RECH. F.

RECH. F. in Bot. Notis. 1939: 495 (1939).

R. bucephalophorus aut. graec. pro magna parte.

Icon.: RECH. F., l.c. 495 (fig. 2, 3).

Annuus. Multicaulis. *Caules* tenues, flexuosi, arcuato-deflexi vel ascendentes, simplices, humiles, (2—)3—10(—20) cm longi. *Folia basalia* numerosa, parva, orbiculari- vel elliptico-spathulata, saepius obtusiuscula, petiolo lamina aequilongo usque subtriplo longiore, diutius persistentia. *E collo radice flores numerosos* verosimiliter cleistogamicos praecoces emittens. *Flores basales* in statu fructifero breviter crassissime hamato-pedicellati, pedicello terete non articulado, saepe plus quam 1 mm crasso; perigonii phylla interiora crassa, 2—2.2 mm longa, triangulari-lingulata, utrinque dentibus tribus \pm rectis brevibus latitudinem valvae non superantibus provisa, prope basin sat distincte callifera, nervatura obsoleta. *Flores caulini* singuli vel saepius 2—3ni perparvi (ca. 1 mm), plerumque omnes pedicellis ab initio elongatis applanato-inflatis incurvis saepissime purpureo-suffusis provisi. *Valvae* fructiferae e floribus caulinis orti anguste linguiformes ca. 2 mm longae, basi angustatae utrinque dentes tres breves subrectos basi vix dilatatos non divaricatos ferentes, nervo mediano basi in callum parvum applanato-globosum incrassato. *Nux* angusta 1.3—1.7 mm longa.

Distr.geogr.: Graecia, Insulae Aegaeae, Turcia, Africa borealis (Cyrenaica, Tripolitania, Tunetia).

Tab. geogr.: RECH. F., l.c. 497 (fig. 3).

As to localities see RECH. F., l.c. 496.

Rumex bucephalophorus L. ssp. *gallicus* (STEINH.) RECH. F.

RECH. F. in Bot. Notis. 1939: 497 (1939).

R. bucephalophorus L. var. *gallicus* STEINH., Ann. Sc. Nat., ser. 2, 9: 200 (1838); MURB. in Act. Reg. Soc. Phys. Lund 10: 8 (1899).

R. bucephalophorus L. var. *tetracanthus* BECK in RCHB. Icon. 24: 42 (1909) p.p.

Icon.: RECH. F., l.c. 495 (fig. 2, 4).

Annuus vel raro perennans [forma *perennans* (Willk.) Rech. f.]. *Caulis* validus, stricte erectus vel basi arcuatus, simplex vel saepius prope basin ramosus, ramis erectis, elatus (6—)20—40(—60) cm altus. *Folia* lanceolata vel elliptica, acuta, basalia cito emarcida, inferiora latitudine ± 2 -plo longiora. *Petiolus* laminam aequans vel usque sesquilingior. E collo radices flores nunquam emittens. *Flores* saepe dimorphi [forma *stenocarpus* (Beck) Rech. f.]; *inferiores* singuli, rarius 2—3ni, brevissime pedicellati, axi appressi, valvis lineari-lingulatis interdum valde elongatis (usque 4 mm), integris vel imprimis sub apice obsolete dentatis, crassis, indistincte nervosis; *flores superiores* bini usque quaterni, pedicellis elongatis clavato-incrassatis applanatis incurvis, valvis fructiferis anguste lingulatis ± 3 mm longis dentibus utrinque ± 3 , inferioribus valvae latitudinem aequantibus vel superantibus, rectis rarius subhamatis, non divaricatis. *Valvae* basi callum minutissimum applanatum reflexum ferentes. Interdum autem flores homomorphi valvis fructiferis omnibus dentatis longe pedicellatis rarissime [forma *massiliensis* (STEINH.) MURB.] homomorphi, omnes valvis lineari-lingulatis subintegris et tum flores plurimi breviter pedicellati axi appressi. *Nux* angusta, ± 1.8 mm longa.

Distr.geogr.: Turcia, Graecia, Italia, Corsica, Malta, Insulae Baleares, Gallia, Hispania, Africa borealis (Tripolitania, Tunetia, Algeria, Marocco).

Tab. geogr.: RECH. F., l.c. 497 (fig. 3).

As for localities see RECH. F. l.c. 498.

Rumex bucephalophorus L. ssp. *canariensis* (STEINH.) RECH. F.

RECH. F. in Bot. Notis. 1939: 502 (1939).

R. bucephalophorus L. var. *canariensis* Steinh., Ann. Sc. Nat., ser. 2, 9: 201 (1838).

R. bucephalophorus L. var. *hexacanthus* BECK f. *canariensis* (STEINH.) BECK in RCHB. Icon. 24: 42 (1909).

Icon.: RECH. F., l.c. 495 (fig. 2, 6).

Annuus. *Caulis* humilis, gracilis, filiformis, saepe a basi ramosissimus, arcuato-ascendens 5—20 cm longus, rarius simplex. *Folia basalia* et *caulina inferiora* late rhombeo-ovata obtusiuscula vel acutiuscula petiolo lamina usque 2-plo longiore. E collo radice flores non emittens. *Flores* interdum dimorphi (forma *heterocarpus* Rech. f.), inferiores plerumque singuli brevissime pedicellati axi appressi, in statu fructifero lineari-lingulati, valvis crassis subintegris usque ad 2.5 mm longis; flores superiores 2 vel 3-ni pedicellis omnibus brevibus valvae longitudinem plerumque non superantibus apice tantum breviter nodoso-vel turbinato-incrassatis, *valvis* e basi paulo dilatata lingulatis ± 2.5 mm longis dentibus utrinque ± 4 , inferioribus subparalleliis rectis sed apice hamatis valvae latitudinem aequantibus vel superantibus. Saepius autem flores homomorphi valvis dentatis; callus minutissimus reflexus. *Nux* ± 1.5 mm longa.

Distr.geogr.: Insulae Canarienses, Porto Santo.

Tab. geogr.: RECH. F., l.c. 501 (fig. 4).

As for localities see RECH. F. l.c. 502.

Rumex bucephalophorus L. ssp. *fruticescens* BORNM.

BORNM. in Engl. Bot. Jahrb. 33: 413 (1904); RECH. F., Botan. Notis. 1939: 503 (1939).

Icon.: RECH. F., l.c. 495 (fig. 2, 7).

Perennis, suffruticosus, multiceps, caules floriferos et sureculos foliosos saepe elongatos emittens. *Folia* caulina inferiora latissime rhombiformia. *Caules* floriferi tenues vel \pm validi, flexuosi vel rarius stricti, ascendentes, simplices vel ramosi. *Flores* dimorphi (inferiores ut in ssp. canariensi) vel homomorphi, etiam in statu fructifero ab eis ssp. *canariensis* vix diversi, interdum autem minus crebre dentati.

Distr.geogr.: Madeira.

Tab. geogr.: RECH. F., l.c. 501 (fig. 4).

As for localities see RECH. F. l.c. 503.

Species incomplete notae.

- R. afer* SAVI, Atti Stor. Nat. Bologna 3: 90 (1830), Aegyptus. — Non vidi.
— *R. afer* SAVI, Cose Bot.: tab. 1, fig. 7—9 (1832), Nuov. Giorn. Lett. 23: tab. 1, fig. 7—9 (1832). — Non vidi.
- R. alexandrinus* Hort. ex SCHULT. f. Syst. 7: 1476 (1830). — Nomen nudum.
- R. arboreus* SALISB. Prodr. 258. — Non vidi. = Probabiliter *R. Lunaria*.
- R. Dregeanus* MEISN. in Linnaea 14: 496 (1840, Port Natal (DRÈGE)). — E speciminibus incompletis descriptus. »Folia hastata quam in *R. Acetosa*

- duplo maiora. Sepala exteriora sinui appressa.» = *R. Dregei* MEISN. in DC. Prodr. 14: 68 (1856).
- R. fimbriatus* POIR., Encyc. 5: 65 (1804), Cap. (Jos. MARTIN).
- R. hararensis* DAMM. in Engl. Jahrb. 38: 61 (1905), Aethiopia, Galla-Hochland: Harar, auf den Bergen (C. ELLENBECK s.n., B). — Non vidi.
- R. lacerus* Hort. ex STEUD. Nom. ed. 2, 0: 159 (1841). — Nomen nudum. = *R. bucephalophorus*?
- R. menzalis* EHRENB. ex BOISS., Fl. Or. 4: 1013 (1879). — = Verosimiliter *R. dentatus*.
- R. pectinatus* EHRENB. ex MEISN. in DC. Prodr. 14: 56 (1856), Aegyptus; lac. Menzaleh (EHRENBERG). — Non vidi. Secundum MEISNER = *R. Ehrenbergii*.
- R. persicarioides* FORSK., Fl. Aeg. Arab. 76 (1775), »In montibus Hadiensibus».
- R. pseudoscutatus* DINTER, Deutsch-S.-W.-Afrika 58 (1909), »Im Ufergebüsch östlich Windhoek, bei Abramsfarm, Blätter breit-herzförmig, hängende, hellbraune, lockere Fruchtrauben». — Incomplete descriptus.
- R. quadridentatus* EHRENB. ex BOISS., Fl. Or. 4: 1013 (1879). — = *R. dentatus*?
- R. sagittifolius* PLENK ex CAMPD. Monogr. Rum. 108 (1819), pro synonymo verosimiliter = *R. abyssinicus*.
- R. scandens* BURCH., Trav. 2: 146 (1822). — Non vidi. = Probabiliter *R. sagittatus*.
- R. scutatus* Herb. BANKS ex CAMPD. Monogr. Rum. 136 (1819) nec al. Prom. b. sp. — = *R. cordatus*?
- R. tuberosus* ECKL. ex STEUD. Nom. ed. 2: 486 (1841). — = *R. sagittatus*?
- R. tuberosus* SIEBER ex MEISN. in DC. Prodr. 14: 67 (1856) pro synonymo. — = *R. lativalvis*?
- R. usambarensis* (ENGL.) DAMMER, Englers Bot. Jahrb. 38: 61 (1905). — Descriptio incompleta.

Species excludendae.

- R. glaber* FORSK., Fl. Aegypt. Arab. 75 (1775), »In desertis Kahirinis». — Verosimiliter = *Emex spinosus*.
- R. spinosus* THBG. Prodr. 67 (1794); Fl. Cap. 341 (1812/13). — = *Emex centropodium* MEISN., Linnaea 14: 490 (1840) = *Emex australis* STEINH.

Hybridae.

- R. conglomeratus* × *crispus*; *R. Schulzei* HAUSSKN., Mitt. d. geogr. Gesellsch. z. Jena 3, 1: 68 (1884).
 M a r o c c o: Marocco borealis prope oppidem Tanger, Djebel Kebir, in horto (LINDBERG 1561, LD).
 T u n e t i a: Tunetia media, Zaouia Sidi Abd-el-Melek (MURBECK s.n., S).
- R. crispus* × *Ginii*; *R. impurus* MAIRE et WEILLER, Bull. Soc. Hist. Nat. Afr. Nord. 31: 38 (1940).
 M a r o c c o: Atlas medius: Ain Kahla, 2000 m. — Non vidi.

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— <i>sagittifolius</i> Plenk ex Campd.	— <i>tuberosus</i> Thunbg.	38
— <i>Samuelssonii</i> Rech. f.	— <i>tunetanus</i> Barr. & Murb.	80
— <i>sarcorrhizus</i> Link.	— <i>uncinulatus</i> Schrad.	89
— <i>scandens</i> Burch.	— <i>usambarensis</i> (Engl.) Damm. ...	111
— <i>Schimperi</i> Meisn.	— <i>vesceritensis</i> Murb.	53
— <i>Schulzei</i> Hausskn.	— <i>vesicarius</i> L.	49
— <i>scutatus</i> Herb. Banks	— — ssp. <i>euroseus</i> Maire	51
— <i>scutatus</i> L.	— — ssp. <i>roseus</i> Holmboe	51
— <i>simpliciflorus</i> Murb.	— — var. <i>singuliflorus</i> Meisn.	49
— — var. <i>libyicus</i> Murb.	— <i>Woodii</i> N. E. Brown	40
— — var. <i>maderensis</i> Murb.	— <i>Woodsii</i> De Not.	88

Acknowledgements.

I am much obliged for revision of locality names to Dr. G. CUFODONTIS, Wien (Ethiopia), Mr. B. DE WINTER, Pretoria (South Africa) and Mr. E. MILNE-REDHEAD, Kew (Tropical Africa).

Addenda.

p. 32 (*R. abyssinicus* JACQ.)

Western Tropical Africa. Gabon: Dougila (DYBOWSKY 70, P.).

Nyasaland. Zamba Mt., common in moist shady situations (WICHE 29598, SAL.).

p. 45—47 (*R. sagittatus* THBG.)

South Rhodesia. Melsetter, ca. 5000 ft. (A. O. CROOK 29014, SAL.), Inyanga, pink stemmed Rambler, streamside (WILD 817, SAL.), Rusapi, Dunedin (E. D. DAYLE 11667, SAL.), Marandellas (DEHN 281, SAL.).

Transvaal. Pilgrims Rest, 4300 ft. (L. E. CODD 6447, SAL.).

Cape Province. Komgha, margins of woods, ca. 2000 ft. (H. G. FLANAGAN 1891, SAL.).