

NEW SPECIES IN ERIOCAULON

by

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During a study of the Eriocaulaceae of New Guinea it became necessary to study the species in the whole of the Malaysian area. In the extra-New Guinean material studied a few new taxa appeared to be present which are described below.

1. *E. alpestre* Hooker f. & Thompson, var. *ampullarium* van Royen, nov. var. — Fig. 1 A.

Differt a var. *alpestre* vagina foliorum apicibus 2 instructa; bracteae involucrantes bicolores, in parte apicali obscuriae nigrae. Basis filamentorum ampulliformis. Typus: *Santos 31747* in Herb. Lugd. Bat.

Small, up to 5 cm, densely caespitose, slender herb. Leaves close together along a stout, up to 1 cm long stem, linear, 1.5–3 by 0.2–0.3 cm, obtuse or acute, sometimes mucronulate, 6-nerved, lax, widened at base and distinctly fenestrate, glabrous. Peduncles numerous, 1–3.5 cm long, 4- of 5-ribbed, twisted, glabrous, at base enveloped by a 1–1.5 cm long sheath, which is obliquely truncate at apex and bifid, finely fenestrate, glabrous. Heads obovoid or subglobose, 2–4 by 2–5 mm, involucral bracts obovate or obovate-oblong, c. 2 by 1.5 mm, rounded or subacute, glabrous on either side, blackish along apical margin, nerveless; floral bracts obovate, c. 2 by 1.5 mm, acute, glabrous, black in the apical third, nerveless; receptaculum glabrous. ♂ Flowers: sepals 3, the median one united with the two lateral sepals, the three free tips ovate or triangular, c. 2 mm long, subobtuse, glabrous, black in the apical half; petals 3, tubuliformly united and only the tips free, the latter linear, c. 0.5 mm long, glabrous, with a black, linear gland at apex; stamens 6, the epipetalous longer than the episepalous, filaments subulate, 0.5–0.7 mm long, flask-shaped at their base, glabrous, anthers subglobose, c. 0.2 mm in diam., black; with a central 3-lobed abortive ovary. ♀ Flowers: sepals 3, the median one united with the two lateral ones, c. 2.5 mm long, the three free tips ovate or triangular, acute, glabrous, black in the apical half; petals 3, free, ovate-lanceolate, markedly narrowed at the base, c. 2.2 by 0.5 cm, acute, with a black, linear gland at apex, glabrous on outside, with white hairs on inside, one-nerved; ovary 3-celled, ovoid, c. 0.5 by 0.2 mm, deeply 3-lobed, sessile; style linear, c. 0.5 mm long, the three free filiform branches moreover c. 0.7 mm long, brownish. Fruits not seen.

Type specimen: *Santos 31747* in L.

Distribution: Luzon.

Benguet subprovince, Pauai: *Santos 31747* (L), fl. April/June (= *E. nigriceps* non Merrill, Merrill, Phil. Fl. Pl. 1, 1925, 193).

Remarks. Closely related to *E. depauperatum* Merrill but differing in the stiffer, shorter and broader leaves with less nerves and also in the 2-tipped sheath enveloping the base of the peduncle. Moreover it differs in the nerveless, black-tipped bracts and sepals.

The new variety differs from var. *alpestre* by the 2-tipped sheaths at base of peduncle, the less denser black sepals in which also the black parts occupy only half of the sepals, and by the smaller globose anthers. Another difference is found in the involucreal bracts which are bicolorous as the apical third is blackish. Also the bases of the filaments are flask-shaped swollen and the infundibulum formed by stamens, filaments and petals is more abruptly narrowed immediately below the insertion of the filaments.

The specific epithet is derived from the flask-shaped bases of filaments.

2. *E. celebicum* van Royen, sp. n. — Fig. 1 B.

Herba pulvinata. Folia dense conferta, 2—2.5 cm × 1.5—2.5 mm, basi longe pilosa. Pedunculi usque 1 cm longi, indistincti costulati. Bracteae involucrantae ellipticae, apiculatae, glabrae; bracteae florales elliptico-obovatae, apice saepe scariosae, extus sparse puberulae. Receptaculum glabrum. Flos ♂: sepala 3, connata, apiculata, apice extus sparse puberuli; petala 3, connata, glandulosa; stamina 6, antheris nigris. Flos ♀: sepala 3, libera, lateralia naviculata, cristata, extus ad apicem et cristam albo-puberula, media spatulata, apice extus intusque albo-puberula; petala 3, libera, glandulosa, extus parte extrema excepta longe albo-pilosa. Ovarium 3-loculare, stipitatum. *Typus: Eyma 863* in Herb. Lugd. Bat.

Small, cushions forming, up to 3 cm high herb. Leaves densely conferted, ensiform or lanceolate, 2—2.5 cm by 1.5—2.5 mm, acute or acutely acuminate, 5—8-nerved, widened at base, rather indistinctly fenestrate, glabrous, but with a large number of long silky hairs in the axil. Peduncles solitary, almost completely hidden among the leaves, up to 1 cm long, indistinctly ribbed, glabrous, but at base with many long white silky hairs. Heads obovoid, 5—6 by 5—7 mm, involucreal bracts elliptic, 4.5—5 by 2.5—3 mm, apiculate, one-nerved, glabrous, floral bracts more obovate than the involucreal bracts, the apex often scarious and with a few hairs on outside near apex, otherwise similar to the former; receptaculum glabrous. ♂ Flowers: sepals 3, tubuliformly united but the lateral ones almost entirely free from each other, spatulate, c. 4 by 1 mm, apiculate, on outside near apex with a few short white hairs; petals 3, lanceolate, slightly unequal, 1—1.5 by 0.3—0.5 mm, acute or bifid, with a large black gland on inside; stamens 6, the epipetalous longer than the alternipetalous, 1—1.5 mm long, filaments subulate, anthers 2-lobed, c. 0.2 mm in diam., black; with an abortive 3-lobed black gynaeceum in the centre. ♀ Flowers: sepals 3, free, the lateral ones boat-shaped with unequal wings, 4—4.5 mm long, apiculate, on outside at apex and along the crest almost over its entire length with short white hairs, the median sepal spatulate, 4—4.5 by c. 1.5 mm, apiculate, with white hairs on outside near apex and on either side in the apical part, apices of the three sepals often scarious, all one-nerved; petals 3, free, spatulate-oblong, c. 5.5 by 1 mm, acute or bifid at apex, on inside with a black gland near apex and with long white

hairs except for the upper part; ovary stipitate, 3-lobed, oblong-ellipsoid, 1—1.5 by c. 1 mm, style 1, 1.5—2 mm long, the three filiform branches moreover 1.5—2 mm long. Capsule similar to the ovary but slightly larger, seeds obliquely ellipsoid, c. 1.5 by 0.7 mm, dark reddish brown, with numerous short white hairs.

Type specimen: *Eyma 863* in L.

Distribution: Celebes.

Enrekang, Bante Mario, alt. 3400 m, open barren country on clay-stone plateau: *Eyma 863* (BO, L), fl. & fr. June.

Remarks. This species closely resembles *E. montanum* van Royen, described from New Guinea, but differs in the smaller leaves, the shorter peduncles, the apiculate bracts and sepals of the female flowers. Comparing these two species with *E. carsonii* F. Muell. there is a gradual decline in size of peduncles and leaves in the sequence *E. carsonii*, *E. montanum* and *E. celebicum* relative to the localities: southern Australia, New Guinea, Celebes. The differences between each pair of species, however, is so large that they can be maintained as separate ones.

E. celebicum is also related to *E. alpinum* van Royen but differs from the latter by having pale yellowish sepals and bracts which are black in the New Guinean species. The same applies to *E. batavorum* van Royen to which some resemblance is present but where the sepals and bracts are also black and their pubescence is denser. Moreover the peduncles in *E. batavorum* are much longer.

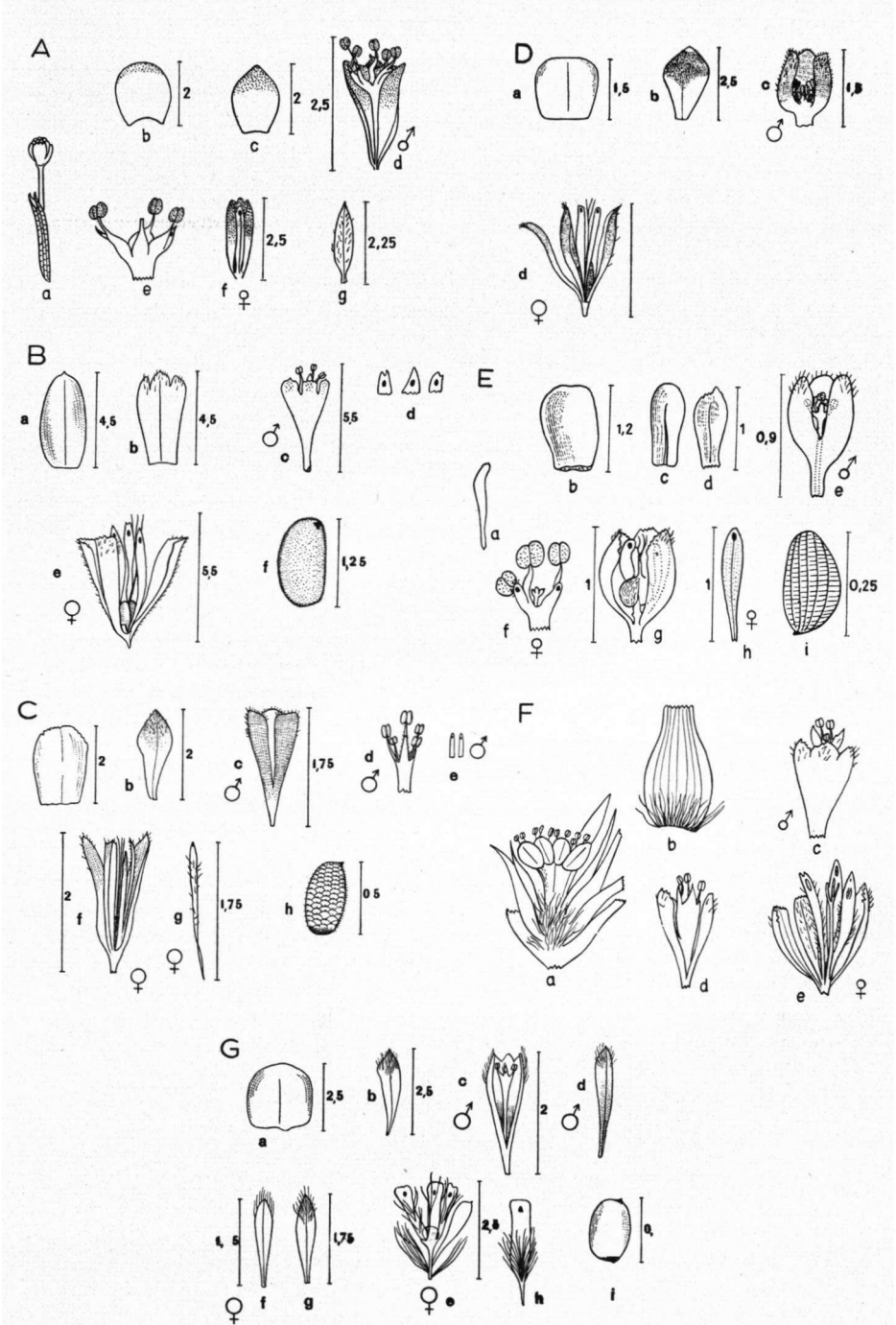
In the pubescence of the axils of the leaves and the small size *E. celebicum* fits into a group of species formed by *E. alpinum*, *E. hookerianum*, *E. kinabaluense*, *E. montanum* and *E. tubiflorum*, which are either montane or alpine species.

The specific epithet has been derived from the island of Celebes.

3. *E. coeruleum* van Royen, sp. n. — Fig. 1 C.

Herba solitaria. Folia laxa, linearia, 3—5 cm × 1.5—3 mm, 10-costata, glabra. Pedunculi usque ad 18 cm alti, 5-costati. Bracteae involucrantes; oblongo-obovatae, apice rotundatae, glabrae; bracteae florales spatulatae,

Fig. 1. A. *E. alpestre*, var. *ampullarium*. a. immature inflorescence and sheath enveloping base of peduncle, b. involucrel bract, c. floral bract, d. male flower, e. apical part of corolla, with stamens, some anthers left out, f. female flower from below, g. petal of female flower, inside. (*Santos 31747*) — B. *E. celebicum*, a. involucrel bract, b. floral bract, c. male flower from above, d. corolla-lobes, male flower, e. female flower, f. seed (*Eyma 863*) — C. *E. coeruleum*, a. involucrel bract, b. floral bract, c. calyx of male flower, d. apex of corolla, with stamens, e. lateral corolla-lobes, f. female flower, g. petal of female flower, inside, h. seed. (*van Steenis 10320*) — D. *E. echinaceus*, a. involucrel bract, b. floral bract, c. immature male flower, from below, d. female flower. (*Nurkas 241*) — E. *E. equisetoides*, a. involucrel bract, seen from aside, b. involucrel bract, inside, c. floral bract, inside, d. idem, e. male flower, from below, f. apex of corolla with some stamens and abortive gynaeceum, some stamens left out, g. female flower, with one petal taken away, h. petal of female flower, i. seed. (*van Steenis 7542*) — F. *E. kinabaluense*, a. part of whole plant, b. base of leaf, inside, c. male flower, from above, d. male flower, e. female flower. (*Clemens 10611*) — G. *E. pilosissimum*, a. involucrel bract, b. floral bract, c. male flower, from below, d. lateral sepal of male flower, e. female flower, two sepals left out, f. sepal of female flower, inside, g. idem, outside, h. petal of female flower, inside, i. seed. (*Eyma 4009*). All scales are in millimeters.



apice acute acuminatae, ad partem apicalem quadrangularem cinerea extusque tantum albo-pilosa. Receptaculum glabrum. Flos ♂ : sepala 3, connata, lateralia obovata, naviculata, apice rotundata vel subtruncata, cristata, cinerea, extus in parte apicali et crista, albo-pilosa, sepalo mediano spathulato-obovato, apice rotundato vel subtruncato; petala 3, inaequalia, glandulosa; stamian 6, antheris nigris. Flos ♀ : sepala 3, libera, naviculata, cristata, nigra, extus ad cristam et partem apicalem albo-pilosa; petala 3, libera, glandulosa vel eglandulosa, intus longe pilosa. Ovarium 3-loculare. Typus: *van Steenis 10320* in Herb. Lugd. Bat.

Small, up to 18 cm tall herb. Leaves conferted, lax, linear, 3—5 cm by 1.5—3 mm, obtuse, widened at base, c. 10-nerved, hardly fenestrate, glabrous. Peduncles up to 18 cm long, 5-ribbed, twisted, distinctly fenestrate, glabrous, at base enveloped by an 1.5—4 cm long, obliquely truncate, acute, twisted, glabrous sheath, which is more fenestrate than the leaves. Heads obovoid, 2—4 by 2—4 mm, involueral bracts oblong-obovate, conchate, 1.7—2.5 by c. 1.5 mm, rounded and scarious at apex, one-nerved, glabrous, floral bracts spatulate, conchate, c. 2 by 0.7 mm, acutely acuminate, greyish in an apical quadrangle and on outside with short, white hairs in the same area; receptaculum glabrous. ♂ Flowers: sepals 3, tubuliformly united but the lateral ones only so at their base with each other, lateral sepals obovate, boat-shaped, c. 1.5 mm long, wings c. 0.5 mm broad, rounded or subtruncate at apex, usually also scarious, greyish, on outside with short, white hairs at apex and on the apical part of crest, median sepal spatulate-obovate, c. 1.5 by 0.5 mm, rounded or subtruncate at apex, greyish, and with short white hairs at apex; petals 3, unequal, the median one oblong, c. 0.2 mm long, obtuse, with a black gland and some white hairs at apex, the lateral ones smaller and without hairs, but otherwise similar to the median one; stamens 6, unequal, the epipetalous c. 0.5 mm long, the alternipetalous ones smaller, filaments subulate, anthers 2-lobed, blackish, less than 0.2 mm in diam., with an abortive 3-lobed, black gynaeceum in the centre. ♀ Flowers: sepals 3, free, oblong-spatulate, boat-shaped, c. 1.5 mm long, wings c. 0.2 mm broad, acuminate, blackish, on outside with short white hairs at apex and along apical part of crest, petals 3, free, oblanceolate or spatulate, with a black gland at apex or without a gland, on inside with long white hairs; ovary ovoid-ellipsoid, 3-lobed, c. 0.5 by 0.3 mm, style 1, 0.5—0.7 mm long, the three filiform branches moreover c. 0.6 mm long. Capsule similar to ovary but slightly larger, seeds ellipsoid-ovoid, oblique, c. 0.5 mm long, brown, with longitudinal rows of short white hairs.

Type specimen: *van Steenis 10320* in L.

Distribution: Celebes.

Path from Rante Lemo via Angin Angin to ridge of Mount Poka Prudjang, alt. c. 1300 m, roadside, in stream: *van Steenis 10320* (BO, L), fl. pretty light blue, fr., June.

Remarks. Differing from many Malaysian species by the blue flowers. Related to *E. alpinum* van Royen but differing from that species by having longer leaves and peduncles, entirely glabrous leaves and free sepals of the female flowers. In habit resembling *E. truncatum* Hamilton but differing from that species in having 3-merous flowers.

The specific epithet is derived from the blue flowers.

4. *E. echinaceum* van Royen, sp. n. — Fig. 1 D.

Herba caespitosa. Folia rigida, acicularia, 1.3—2 cm \times 0.5—1.5 mm, indistincte 4- vel 5-costata, glabra. Pedunculi usque 50 cm longi, 5-costati. Bracteae involuerantes obovatae, rotundatae, glabrae; bracteae florales spathulatae, acutae, in quadrangulo apicale nigrescentes, extusque albobilosae, apice extremo glabrae. Receptaculum sparse longepilosum. Flos σ : sepala 3, lateralia naviculata, in parte superiore nigrescentia, extus in parte apicali albo-pilosa, mediana oblongo-spathulata; petala 3, glandulosa, extus in parte apicali sparse albo-pilosa; stamina 6, antheris nigris. Flos ρ stipitatus; sepala 3, libera, lateralia naviculata, nigrescentia, sed in parte basali flavida, in parte apicali cristaque, extus sparse albo-pilosa, mediana oblanceolata-spathulata; petala 3, spathulata, glandulosa. Ovarium 3-loculare. Typus: *Nurkas 241* in Herb. Lugd. Bat.

Tall, up to 50 cm long, caespitose herb. Leaves conferted, stiff, acicular, 1.3—2 cm by 0.5—1.5 mm, flat at inside, indistinctly 4- or 5-ribbed, obtuse, widened at base, indistinctly fenestrate, glabrous. Peduncle up to 50 cm long, 5-ribbed, twisted, glabrous, at base with an 5.5—10.5 cm long sheath, which is slightly twisted and many-ribbed, obliquely truncate at apex but the acute tip sometimes split into 2 or 3 acute ones, glabrous. Heads obovoid, 2.5—3.5 by 3.5—4.5 mm, involueral bracts broadly obovate, concave, 1.5—2 by c. 1.5 mm, rounded, margin scarios, glabrous, one-nerved, floral bracts spatulate, concave, the apical part almost perpendicular to the lower part, 2—2.5 by c. 1.5 mm, acute, blackish in an apical quadrangle and finely white puberulous on outside in the same area except for the utmost tip; receptaculum with a few scattered, long white hairs. σ Flowers: sepals 3, tubuliformly united but the lateral ones united in the basal third only, the lateral ones boat-shaped, 1.5—2 mm long, wings 0.2—0.5 mm broad, rounded to truncate, margin scarios, blackish in the upper half, on outside at apex with short white hairs, the median ones oblong-spatulate, 1—1.5 by c. 0.5 mm, rounded or acute, margin scarios, one-nerved, otherwise similar to the other sepals; petals 3, lanceolate-triangular, less than 0.2 mm long, acute, with a black gland on inside, with a few, short white hairs at apex; stamens 6, the epipetalous longer than the alternipetalous, 1—1.5 mm long, filaments subulate, anthers 2-lobed, c. 0.2 mm in diam., black; with an abortive, 3-lobed, black gynaecium in the centre. ρ Flowers stipitate: sepals 3, free, the lateral ones boat-shaped, 1.5—2 mm long, wings unequal, c. 0.3 mm broad, acute, blackish except for the base, acutish subtruncate, apex scarios, with a few short, white hairs at apex and along crest, median sepal oblanceolate-spatulate, c. 1.5 by 0.2 mm, obtusish, scarios at apex, blackish except for the base, with a few white hairs at apex, one-nerved; petals 3, spatulate, c. 1.5 by 0.2 mm, rounded, with a black gland at inside, one-nerved; ovary oblong-ovoid, c. 0.7 by 0.5 mm, 3-lobed; style 1, c. 0.5 mm long, the three filiform branches moreover c. 0.5 mm long. Fruits unknown.

Type specimen: *Nurkas 241* in L.

Vernacular names: anda ululu, isa isa.

Distribution: Celebes.

Remarks. A species very easy to recognize by the short, stiff leaves which much resemble the spines of a hedgehog (*Echinaceus euro-*

paeus) and by the sheath enveloping the base of the peduncle, which is much longer than the leaves.

The specific epithet has been derived from the spine-like leaves which resemble, being crowded as they are, a hedgehog.

5. *E. equisetoides* van Royen, sp. n. — *E. setaceum* (non Linnaeus) Steen., *Tropische Natuur* 25, 1936, 107, fig.; Backer, *Noodfl. Java* 10a, 1949, Fam. 214, 1 — **Fig. 1 E.**

Herba fluitans, caule elongato, dense foliato, foliis inferne alterne, sed apice pseudoverticillatim dispositis. Folia linearia, apice filiformia, 1.5—8.5 cm longa, 1-costata, glabra. Pedunculi pauci vel numerosi, 1—13 cm longi, 5- vel 6-costulati. Bracteae involucrantes oblongo-obovatae vel sub-orbiculares, apice rotundatae, extus sparse cinereo-rugulosae, ceterum glabrae; bracteae florales spathulatae vel spathulato-obovatae, apice rotundatae, subacutae vel acutae, glabrae. Receptaculum glabrum. Flos ♂: sepala 3, connata, late spathulata, apice rotundata, extus apice tantum albo-pilosa; petala 3, elliptico-oblonga, glandulosa, margine glabra vel albo-pilosa; stamina 6; antherae nigrae. Flos ♀: sepala 3, libera, naviculata, apice rotundata, extus apice tantum sparse albo-pilosa; petala 3, libera, spathulata, glandulosa. Ovarium 3-loculare. Typus: *van Steenis 7542* in Herb. Lugd. Bat.

Small to medium sized herb with an up to 20 cm long, slender, densely foliate stem and a rosette of leaves and peduncles at apex of stem. Leaves scattered along the stem, linear, 1.5—8.2 cm, filiform at apex, one-nerved, fenestrate, slightly wider at base, glabrous. Peduncles few to numerous, at apex of stem, 1—13 cm long, 5- or 6-ribbed, twisted, glabrous, at base enveloped by an 0.8—3.5 cm long, fenestrate sheath, which is obliquely truncate, one- or two-tipped at apex, but in the mature sheath the margin scarious. Heads obovoid, semi-globose or globose, 0.2—1 by 1.5—3 mm, involueral bracts oblong-obovate or suborbicular, conchate, c. 1.2 by 0.7 mm, rounded, with small scattered greyish warts on outside, glabrous, nerveless; floral bracts spatulate or spatulate-obovate, conchate, c. 1.2 by 0.5 mm, rounded, subacute or acute, apical margin sometimes scarious, glabrous; receptaculum glabrous. ♂ Flowers: sepals 3, broadly spatulate, tubuliformly united, the two lateral sepals up to a half only, c. 1 mm long, the three free tips rounded, margins scarious, outside at apex with short white hairs; petals 3, free, elliptic-oblong, less than 0.2 mm long, obtuse, with a black gland near apex, and with or without a few short white hairs along margin; stamens 6, the epipetalous longer than the episepalous ones, 0.2—0.5 mm long, filaments subulate, anthers subglobose, laterally compressed, less than 0.2 mm in diam., black; with a distinct, stipitate, 3-lobed, abortive gynaeceum. ♀ Flowers: sepals 3, free, broadly obovate, conchate-naviculate, c. 1 by 0.5 mm, rounded, often scarious along margin, on outside near apex with a few white, short hairs, one-nerved; petals 3, free, spatulate, c. 1 mm long, inserted immediately below the ovary slightly higher than the sepals, with a black gland near apex, one-nerved; ovary deeply 3-lobed, c. 0.5 by 0.5 mm, stipitate; style 1, c. 0.2 mm long, the three free, filiform branches c. 0.2 mm long. Capsule 3-seeded, seeds obliquely ellipsoid-ovoid, c. 0.2 mm long, angular, rounded at apex, mammillate and dark brown at base, with numerous small papillae, pale yellow.

Typus: *van Steenis 7542* in L.

Ecology: In bogs on clay, and in ricefields.

Distribution: Java (also Banka and Sumatra?).

JAVA. West Java, Indramaju, Plosokerep, alt. 10 m, teak forest area: *van Steenis 7542* (BO, L, SING), fl. & fr. March.

BANGKA. Sungei Slan: *Teysmann s.n.* (BO), sterile.

SUMATRA. Palembang: *Buurman van Vreeden s.n.* (BO), sterile.

Remarks. Closely related to *E. setaceum* L. but differing from that species by the glabrous receptaculum and the stipitate ovary.

The specific epithet is derived from the resemblance of the whole plant to a species of *Equisetum*.

6. *E. kinabaluense* van Royen, sp. n. — *E. brevipedunculatum* (non Merrill) Suessenguth & Heine, Fedde Rep. 54, 1951, 224 — Fig. 1 F.

Herva parva, caespitosa. Folia lineari-ensiformia, 1.5—2.5 × 0.2—0.5 cm, acuta, 7—9-costata, glabra. Pedunculi 0.5—1.4 cm longi. Bracteeae involucrentes elliptico-oblongae, obtusae, glabrae; bracteeae florales obovatae, subacuminatae, extus infra apicem albo-pilosae. Receptaculum longe pilosum. Flos ♂: sepala 3, connata, lateralia obovata, apice rotundata, extus infra apicem et ad marginem sparse albo-pilosa, intus dense pilosa; petala 3, connata, glandulosa; stamina 6; antherae nigrae. Flos ♀: sepala 3, libera, obovato-oblonga vel spatulata, interdum inaequilateralia, apice rotundata, extus infra apicem et ad marginem albo-pilosa, intus omnino pilosa; petala 3, libera, oblanceolata, glandulosa. Ovarium 3-loculare. Typus: *Clemens 10611* in Herb. Lugd. Bat.

Small, densely caespitose herb, up to 3 cm high, with an up to 5 mm long, unbranched stem with long white hairs. Leaves densely conferted along a 1—1.5 cm long stem, linear-ensiform, 1.5—2.5 by 0.2—0.5 cm, acute, 7—9-nerved, flaccid, widened at base and fenestrate, glabrous. Peduncle solitary, 0.5—1.4 cm long, glabrous. Heads broadly ovoid to subglobose, 4—5 by 5—6 mm; involucreal bracts elliptic-oblong, 2.5—3.5 by 1.5—2.5 mm, apex obtuse, irregularly dentate or scarious, membranous, glabrous, one-nerved; floral bracts obovate, broadly concave, 2.5—3.2 by 1.7—2.2 mm, apex indistinctly acuminate, whitish hairy on the outside below the apex, one-ribbed; receptaculum with long white hairs. ♂ Flowers: sepals 3, united up to $\frac{7}{8}$ but the two lateral ones mutually united up to $\frac{1}{4}$ only, obovate, c. 2.5 mm long, the free lobes c. 0.3 mm long, apex rounded, margin scarious, with a few white hairs at the back below apex and along margin, entirely covered with hairs within; petals 3, united slightly over halfway, free part lanceolate, c. 1.2 mm long, acute or bifid, with a large black gland within; stamens 6, the epipetalous longer than the episepalous, filaments lanceolate, the episepalous c. 0.6 mm, the epipetalous c. 1 mm long, anthers 2-lobed, black, c. 0.2 mm long; with an abortive 2-lobed gynaecium in the centre. ♀ Flowers: sepals 3, free, obovate-oblong or spatulate, sometimes oblique, c. 2.5 mm long, apex rounded, irregularly dentate and scarious, one-nerved with white hairs on the back below the apex, along margin and within; petals 3, free, oblanceolate, c. 3.5 mm long, acute or bifid, with a large black gland at apex and white hairs along margins and within. Ovary 3-celled, 3-lobed, ellipsoid-ovoid, c. 1 by 0.7 mm, very shortly stipitate. Style 1, c. 1 mm long, the 3 subulate

branches c. 1.5 mm long. Fruit 3-celled, with one ellipsoid, glabrous, transparent, yellow or brown seed in each cell.

Type specimen: *Clemens 10611* in L.

Ecology: On wet slopes at high altitudes.

Distribution: Borneo.

Sandakan, Mt Kinabalu, Paka Cave: *Clemens 10611* (A, BO, K, L), fl. Nov.; ibidem, Victoria Peak, alt. 4200 m, in shelter of boulders below sheet of ice: *Clemens* & *Clemens 27777* (L), fl. & fr. Jan., fl. heads brown; ibidem, Marai Parai, alt. 3400: *Clemens* & *Clemens 32536* (L), fl. & fr. May, grows in mats; ibidem, granite dome, alt. 4200 m: *Clemens* & *Clemens 27089* (BM, L), fl. & fr. Nov.; ibidem, Gurulau Spur, alt. 4100 m, windswept granite, wet: *Clemens* & *Clemens 51120* (L), fl. & fr., densely caespitose.

Remarks. In habit closely related to *E. brevipedunculatum* Merrill, but differing from that species by the pubescent involucral bracts, the long white hairs on the stem and on the inside of the sepals of the male flowers.

Closely similar to *E. hookerianum* Stapf in the floral details but differing from that species in the very short peduncle and by the yellow sepals of both types of flowers.

The specific epithet is derived from the type locality.

7. *E. pilosissimum* van Royen, sp. n. — Fig. 1 G.

Herba alta, solitaria. Folia linearia, 7—17 cm × 1.5—2.5 mm, apice rotundata vel obtusa, glabra. Pedunculi usque ad 35 cm longi, glabri. Bracteae involucrantae suborbiculares, glabrae, florales spatulato-obovatae, acuminatae, extus in quadrangulo apicali longe albo-pilosae. Receptaculum dense albo-lanatum. Flos ♂ stipitatus; sepala 3, connata, lateralia naviculata, apice acuminata, extus in quadrangulo apicali longe albo-pilosa, mediana oblanceolata, ceterum lateralibus similia; petala 3, oblonga, apice rotundata vel acuta, intus glandulosa longeque albo-hirsuta; stamina 6; antherae nigrae. Flos ♀ stipitatus; sepala 3, libera, oblanceolata vel spatulata, apice acuminata, extus in quadrangulo apicalia longe albo-pilosa; petala 3, libera, stipitata, apice acuta vel truncata, intus apice glandulosa, in parte basali longe albo-hirsuta. Ovarium stipitatum, 3-loculare. Typus: *Eyma 4009* in Herb. Lugd. Bat.

Tall, up to 35 cm high herb. Leaves conferted at base of peduncles, linear, 7—17 cm by 1.5—2.5 mm, straight or sometimes falcate, rounded or obtuse at apex, slightly widened at base, multi-nerved (over 8), glabrous. Peduncles 1 or 2, up to 35 cm long, 6-ribbed, twisted, glabrous, at base with an up to 9 cm long sheath, which is obliquely truncate and acuminate at apex, often split at tip into two, multinerved, glabrous, slightly twisted. Heads broadly obovoid to subglobose, 3—6 by 5—7 mm, involucral bracts suborbicular, 2—2.5 by c. 2 mm, rounded at apex, one-nerved, glabrous, reflexed in anthesis, floral bracts spatulate-obovate, boat-shaped, 2—2.5 by c. 0.7 mm, acuminate, one-nerved, on outside with long white hairs in an apical square; receptaculum densely whitish woolly. ♂ Flowers stipitate: sepals 3, tubuliformly united but the lateral ones united at the base only, the lateral ones boat-shaped, 2—2.5 mm long, the wings less than 0.5 mm wide, acuminate, on outside with long white hairs in an apical square, the median sepals oblanceolate, otherwise similar to the lateral ones; petals 3, oblong c. 0.5 mm long, rounded to acute, on inside with a large black

gland and long white hairs, stamens 6, c. 0.5 mm long, filaments subulate, anthers 2-lobed, less than 0.3 mm in diam., black; with a abortive, black gynaeceum in the centre. ♀ Flowers stipitate: sepals 3, free, 1.5—2 by c. 0.5 mm, oblanceolate or spatulate, the lateral ones very slightly concave, acuminate, one-nerved, on outside with long white hairs in an apical square; petals free, stipitate, oblong-spatulate, c. 1.5 by c. 5 mm, acute or truncate, on inside with a black, triangular or ovate gland and with long white hairs in the basal part; ovary stipitate, broadly ovoid, 3-lobed, c. 0.5 mm in diam., yellowish brown, style c. 1 mm long, the three filiform branches moreover c. 0.5 mm long. Capsule similar to the ovary but larger, seeds ellipsoid or ellipsoid-obovoid, c. 0.5 mm long, light brown, glabrous.

Type specimen: *Eyma 4009* in L.

Distribution: Celebes.

Menado, Kolonedale subdivision, between Tomata and Kamba: *Eyma 4009* & *4009 bis* (BO, L), fl. white, fr. Oct.; Masambe, Wono, open country, alt. 1000 m: *Eyma 1238* (BO, L), fl. & fr. July, without leaves and the identification uncertain.

Remarks. This species is to be distinguished from all Malaysian species by the large mass of hairs on many floral parts, a number so large that when on dissecting a head, at the first glance hardly any other details can be observed. It is related to none of the Malaysian species but comes near to *E. quinquangulare* L., *E. walkeri* Hooker f., and *E. henryanum* Ruhland from Continental Asia. From the first *E. pilosissimum* differs by the shortly acuminate floral bracts, the acuminate sepals of the male flowers and the pubescence on the inside of the female petals. From *E. walkeri* the new species differs in the longer leaves and peduncles and in the acute male sepals. From *E. henryanum* *E. pilosissimum* differs in the longer leaves, and in the yellowish sepals of both types of flowers.

8. *E. sollyanum* Royle [Illustr., 1840, 409, t. 97, f. 1], var. *sumatranum* van Royen, nov. var.

Differt a var. *sollyanum* receptaculo glabro, pilis sepalorum longioribus, petalis floris ♀ angustioribus, linearibus, glandulosis vel eglandulosis. Typus: *Bünnemeyer 8950* in Herb. Lugd. Bat.

Differs from var. *sollyanum* in the glabrous receptaculum, the longer hairs on the sepals and in the narrower, linear petals in the female flowers, the latter sometimes are provided with a punctiform gland which is much smaller than in var. *sollyanum*.

Type specimen: *Bünnemeyer 8950* in L.

Distribution: Sumatra.

Sumatra West Coast, Mount Kurinchi, alt. 1500 m: *Bünnemeyer 8950* (BO, L, SING), fl. & fr. March; ibidem, Sungei Kumbang, 1500 m: *Robinson & Kloss s.n.* (BM, SING), fl. & fr. April; Padang Upper Lands, Batuh Gombak, Laras Talang, alt. 1400 m: *Bünnemeyer 5763* (BO, L), fl. & fr. Nov.; Mount Talang, alt. 1500 m: *Bünnemeyer 5203* (BO, L, SING), fl. & fr. Oct. — Tapanuli, Lake Tobah, in marshes, 1000—1600 m: *Junghuhn s.n.* (L), fl. & fr. Nov.; ricefields on altiplain south of Lake Tobah: *Junghuhn s.n.* (L), fl. & fr.; Karo altiplain near Brastagi, alt. 1300 m: *Lörzing 6729* (L), fl. & fr. July; vicinity of Raja, alt. 1250 m: *Lörzing 7080* (L), fl. Jan.; north of Bandarbaru, alt. 750 m: *Lörzing 6409* (L), fl. & fr. May; Tutupan distr.: *Rahmat Si Boeea 6008* (L, MI), fl. & fr. Nov.; ibidem: *Rahmat Si Boeea 5963* (L, MI), fl. & fr. Nov.; Si Makkark at high plateau level on the Toba trail north of the Asahan river: *Bartlett 7457* (L), fl. & fr. April; Dolak Ri da Bolak, Toba: *Rahmat Si Boeea 10343* (L), fl. & fr. Oct./Dec.