

NEODRIESSENIA: A NEW GENUS OF MELASTOMATACEAE

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ABSTRACT

Neodriessenia, a new genus of Melastomataceae, endemic to the Island of Borneo, is described here. *Neodriessenia* is allied to *Driessenia* Korth. but differs in having stamens with conspicuously produced connective which are dorsally spurred and ventrally long produced appendage with subdivergent apex and in the presence of characteristic 4-lobed glands all along the branches, leaves and inflorescence; whereas the genus *Driessenia* Korth. has stamens with slightly produced connective which are dorsally spurred and ventrally bisetose and has no 4-lobed glands. Following new species, new varieties and new combinations are established here: *Neodriessenia hirta* (Ridl.) Nayar, *N. hirta* (Ridl.) Nayar var. *petiolata* Nayar, *N. pilosa* Nayar, *N. rubrovenia* Nayar, *N. scorpioidea* (Stapf) Nayar, *N. crystallina* (Stapf) Nayar and *N. purpurea* Nayar.

Neodriessenia Nayar, gen. nov. ad oxysporas Triana pertinet, affinis *Driesseniae* Korth., sed connectivo basi longe producto dorsaliter calcarato ventraliter in appendices crassas, apice subdivergentes, longe producto; ramulis, foliis inflorescentisque glandulosis, glandulis 4-lobatis differt.

Suffrutex. Rami quadrangulares vel subquadrangulares, dense fusco-glanduloso et furfuracei. Folia opposita, subaequalia, vel inaequalia, ovate, elliptica vel elliptico-ovata, supra sparse glandulosa, subtus dense glandulosa, glandulis 4-lobatis, glaucescentia, 5-9 nervia, venulis transversis distinctis ornata, petiolata vel subsessilia. Inflorescentia terminalis et axillaris, paniculata, dense glandulosa. Flores tetrameri. Calycistubus campanulatus, glandulosus, limbus subtruncatus vel dentatus. Petala 4, oblongo-ovata vel rotundato-ovata. Stamina 8, subaequalia, connectivo basi producto antice appendiculato, appendiculis subdivergentibus, postice calcarato. Ovarium calycis tubo adnatum, coronatum, lobis minute denticulatis instructum. Stylus filiformis, stigmat haud conspicuum, punctiforme. Capsula quadrivalvis. Semina minuta, cuneata, numerosa.

Subshrub. Branches quadrangular or sub-

quadrangular, densely glandulose and furfuraceous. Leaves opposite, subequal or unequal, ovate, elliptic or elliptic ovate, upper surface sparsely glandulose, undersurface densely glandulose, glands 4-lobed, glaucescent, 5-9 nerved, transverse venules distinct, petiolate or subsessile. Inflorescence terminal or axillary, paniculate, densely glandulose. Flowers tetramorous. Calyx tube campanulate, glandulose, limb subtruncate or dentate. Petals 4, oblong-ovate or rotundate-ovate. Stamens 8, subequal, connective produced at the base, dorsally calcarate, ventrally with a long appendage with subdivergent apex. Ovary adnate to the calyx tube, coronate, disc with minutely denticulate lobes. Style filiform, stigma not conspicuous or punctiform. Capsule quadrivalved. Seeds: minute, cuneate, numerous.

Type species: Neodriessenia scorpioidea (Stapf) Nayar.

Distribution: Endemic to Borneo.

Dr. O. Stapf (l.c.) described *Driessenia scorpioidea* and *D. crystallina* and referred them to the newly proposed section *Scorpioides* because of their scorpioid inflorescence. However, Ridley (in Journ. Str. Br. Roy. As. Soc. 57: 40. 1911.) transferred *D. scorpioidea* to the genus *Campimia* Ridl. and stated as

follows: "Stapf's *D. scorpioidea* differs from other species of the genus in its scorpioid inflorescence and from *Driessenia* in having only one appendage to the stamens instead of two". Ridley's observations on the nature of the staminal appendages in *D. scorpioidea* are incorrect as the stamens are actually provided with a spur dorsally and a thick appendage ventrally which is divergent at the apex; whereas in Ridley's *Campimnia* there is only a dorsal staminal appendage. The nature of the staminal appendages and the characteristic four lobed glands in *Driessenia scorpioidea* Stapf, *D. crystallina* Stapf and *D. hirta* Ridl. indicate that they form a homogenous group and so merit the erection of a new genus *Neodriessenia*. Additional species *Neodriessenia purpurea* Nayar, *N. pilosa* Nayar, *N. rubrovenia* Nayar, from Borneo are described here.

The species are readily separable by their distinct facies. Regarding the nature and size of flowers, no marked variation occurs within the genus.

The contrasting characters of *Neodriessenia* and *Driessenia* are given in the following Table.

<i>Neodriessenia</i>	<i>Driessenia</i>
1. Densely covered with 4-lobed glands in the branches, leaves and inflorescence	4-lobed glands absent
2. Calyx minutely 4-dentate or subtruncate	Calyx tube prominently lobed rarely minute; lobes triangular or linear
3. Connective produced	Connective slightly produced
4. Connective ends in a short spur dorsally and a thick long appendage ventrally which is divergent at the apex	Connective ends in a spur dorsally and two linear appendages ventrally

Key to the species of Neodriessenia

1. Inflorescence densely setose
2. Opposite leaves prominently unequal, leaves larger 10-20 cm × 5-9 cm, upper surface of leaves not velutinous, but sparsely glandulose

N. hirta

- 2a. Larger leaves sessile *N. hirta* var. *hirta*
- 2a. Larger leaves petiolate *N. hirta* var. *petiolata*
2. Opposite leaves subequal, leaves smaller 3.5-14 cm × 1.2-6 cm, upper surface of leaves densely velutinous and glandulose pilose *N. pilosa*
1. Inflorescence non setose
3. Inflorescence subfasciculate, c. 1 cm long, 3-5 flowers, few flowered *N. rubrovenia*
3. Inflorescence paniculate, more than 5 cm long, many flowered
4. Leaves petiolate
5. Leaves large, 20-22 cm × 10-13 cm, apex abruptly acuminate, 5-9 nerved; petiole 2.5-3 cm long *N. scorpioidea*
5. Leaves smaller, 9-13 cm × 4-6 cm, apex acuminate, 3-5 nerved; petiole 3-4.5 cm long *N. crystallina*
4. Leaves sessile or subsessile *N. purpurea*

ENUMERATION OF SPECIES

Neodriessenia hirta (Ridl.) Nayar comb. nov.

Driessenia hirta Ridl. in Kew Bull. 34. 1946.

Type: Borneo, *Haviland* 3140 (Holotype K).

A small shrub, 2 m in height. *Branches* quadrangular, densely glandulose puberulous. *Leaves* opposite, leaves prominently unequal, widely lanceolate or lanceolate-elliptic, larger leaves 15-23 cm × 4.5-8.5 cm, smaller leaves: 5-9 cm × 3-4 cm, base cuneate and briefly rounded, apex long acuminate, margin entire or briefly sinuate, 5-7 nerved, cross-venules distinct in the upper and lower surface, reticulate, sparsely glandulose on the upper surface, densely glandulose and puberulous on the undersurface, nerves on the undersurface usually setose membranous, sessile. *Inflorescence* axillary, paniculate, 5-6 cm long, glandulose, furfuraceous and setose; pedicel slender 1.5 mm long. *Calyx* tube campanulate 2.5 mm long, densely glandulose-setose, calyx limb 4-lobed, lobes 0.3 mm long. *Petals* 4, minute, oblong 1-1.5 mm long. *Stamens* 8, subequal, filament filiform 3-4 mm long, anther oblong, curved 2-2.5 mm long, dorsally ends in a tubercle

and ventrally ends in an appendage with divergent apex, 1.5 mm long.

Distribution: Borneo (endemic). *Borneo*: Sarawak. Rejang, Belaga, Kalong, Nov. 1892, *Haviland* 3140 (K); Upper Rejang river, Gat. J. & M. S. *Clemens* 21566 (K); Teneong, alt. 600 m, 7 Sept. 1954, *W. M. A. Brooke* 9190 (BM); Bah, Div. 3, 16 Aug. 1954, *W. M. A. Brooke* 9038 (BM, L); Giam Pasang, Kiv. 3, 9 Sept. 1954, *W. M. A. Brooke* 9239 (L).

The presence of setose hairs in the nerves is not uniform. In the specimen J. & M. S. *Clemens* 21566 the nerves on the undersurface of leaves are glabrate.

Neodriessenia hirta (Ridl.) Nayar var. ***petiolata*** Nayar var. nov.

Type: Borneo, *Paul Chai* S. 18957 (Holotype K.). Typi similis, sed foliis petiolatis differt.

Distribution: Endemic to Borneo. *Borneo*. Sarawak. Pelagus rapids, 28 Nov. 1963, *Paul Chai* S. 18957 (K); Indonesian Borneo: West Kutei, Mt. Palimasan near Tabang on Belajan river, alt. 600 m, 14 Sept. 1956, *A. Kostermans* 13049 (L).

Neodriessenia pilosa Nayar sp. nov.

N. rubroveniae Nayar affinis, sed foliis minoribus supra dense glanduloso-hirtis, venulis foliorum numquam rubris, inflorescentiis breviter paniculatis differt. **Type:** Borneo, *Richards* 2475 (Holotype K. Isotype L).

Suffrutex ad 1 m altus. *Rami* adulti subteretes, juveniles angulati, dense glanduloso-hirti. *Folia* opposita, ovato-lanceolata vel elliptica, 3.5-6.5 cm $\times$ 1.5-2 cm, rubescentia (teste collectoris), basi obtusa vel cuneata, apice breviter acuminata, margine integra, supra et subtus dense glanduloso-hirta, supra velutina, 3-nervia, venulis transversis supra haud distinctis, venulis transversalibus subtus manifestis, petiolus 5-23 mm longus, glanduloso-hirtus. *Inflorescentia* axillaris vel terminalis breviter paniculata, 2-3 cm longa, dense glanduloso-hirta; bracteae lineares, 1-4 mm

longae; pedicellus 5-8 mm longus, dense glanduloso-hirtus. *Calycis* *tubus* campanulatus, limbus minute 4-lobatus, 2-2.5 mm longus, dense glanduloso-hirtus. *Petala* 4, oblonga, 2 mm $\times$ 1.5 mm. *Stamina* 8, filamentis 1.5 mm longis, antheris 1.8-2 mm longis, connectivo dorso calcarato, antice appendiculato, appendiculis subdivergentibus intracta. *Ovarium* pro $\frac{1}{2}$ longitudinis calycis tubi perfecte adnatum; *stylus* 1.8-2 mm longus, stigmatibus haud conspicuis. *Capsula* subglobosa, 2.8-3 mm $\times$ 2.5 mm, dense glanduloso-hirta. *Semina* minute cuneata, 0.2 mm longa, numerosa.

Subshrub up to 1 m height. *Branches* subterete, angular when young, densely glandulose hirtous. *Leaves* opposite, ovate-lanceolate or elliptic, 3.5-6.5 cm $\times$ 1.5-2 cm, base obtuse vel cuneate, apex shortly acuminate, margin entire, upper and lower surface densely glandulose-hirtous, upper surface velutinosus, 3-nerved, transverse venules on the upper surface hardly distinct, transverse venules on the lower surface prominent, rubescent; petiole 5-23 mm long, glandulose-hirtous. *Inflorescence* axillary, or terminal shortly paniculate, 2-3 cm long, densely glandulose hirtous; bracts linear, 1-4 mm long; pedicel, 5-8 mm long, densely glandulose hirtous. *Calyx* tube campanulate, minutely 4-lobed, 2-2.5 mm long, densely glandulose hirtous. *Petals* 4, oblong, 2 mm $\times$ 1.5 mm. *Stamens* 8, filament 1.5 mm long, anther 1.8-2 mm long, connective dorsally calcarate, ventrally ends in a sub-divergent appendage. *Ovary* adnate to the calyx tube up to the middle. *Style* 1.8-2 mm long, stigma hardly conspicuous. *Capsule* subglobose, 2.8-3 mm $\times$ 2.5 mm densely glandulose hirtous. *Seeds* minutely cuneate, 0.2 mm long, numerous.

Distribution: Borneo (endemic). *Borneo*. Sarawak. Mt. Dulit, Ridge Div., alt. 1200 m, 6 Nov. 1932, *Richards* 2475 (K, L); Ibid., alt. c. 1230 m, 12 Sept. 1932, *Richards* 1743 (K). Bintulu, Ulu Tubaun, alt. 350 m, 6 Apr. 1963 *P. S. Ashton* S. 18401 (K, L).

Neodriessenia pilosa is allied to *N. rubrovenia* but differs in having smaller leaves, shortly paniculate inflorescence and glandulose hirtus upper surface of leaves; whereas in *N. rubrovenia* the venules are reddish tinged, the inflorescence is subfasciculate and the upper surface of leaf is glabrate and glandulose.

***Neodriessenia rubrovenia* Nayar sp. nov.**
(Fig. 1).

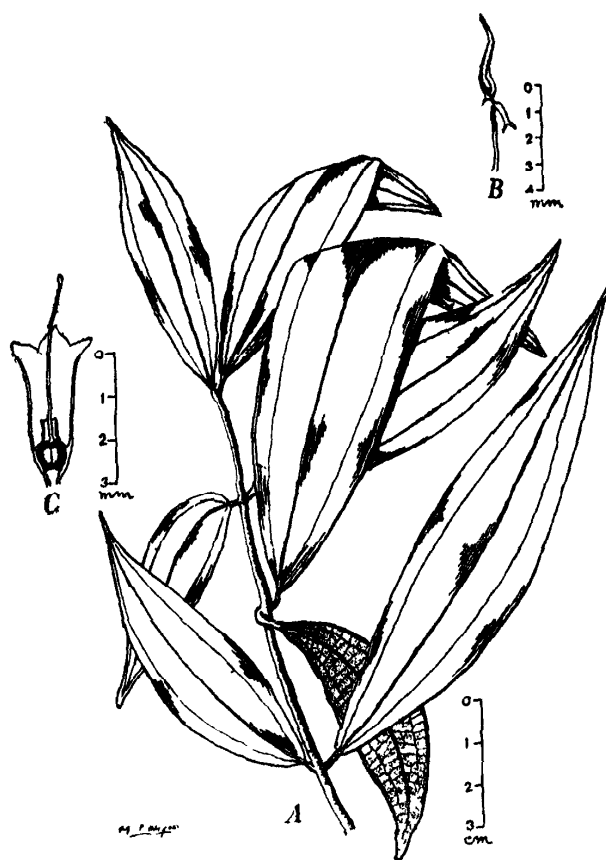
N. pilosae Nayar affinis, sed foliis majoribus, supra parce glandulosis vel glabris, venulis foliorum rubris inflorescentiis subfasciculatis differt.

Type: Borneo. Jacobs 5191 (Holotype K).

Suffrutex ad. $\frac{1}{2}$ m altus. *Rami* adulti tereti, juveniles angulati, dense glanduloso-puberuli. *Folia* opposita, subaequalia, elliptico-lanceolata, 7-13 cm $\times$ 1.5-3 cm, membranacea, basi cuneata, apice acuto-acuminata, margine integra, supra sparse glandulosa vel glabrata, subtus dense glandulosa, subtus ad nervos dense glanduloso-puberula, 3-5 nervia, venis rubris, venulis transversis subtus distinctis ornata, petiolus 3-8 mm longus. *Inflorescentia* axillaris, subfasciculata, pauciflora, glandulosa, c. 1 cm longa; pedicellus 4.5-5 mm longus. *Calycis* *tubus* campanulatus, 2.5-2.8 mm longus, dense glandulosus, limbus minute 4-lobatus 0.3-0.4 mm longus. *Petala* 4, parva, oblonga, c. 2 mm longa, alba (teste collectoris). *Stamina* 8, subaequalia, filamentis 2.8-3 mm longis, antheris oblongo-lanceolatis 2-2.5 mm longis, apice rostrato-acuminatis, connectivo dorso in tuberculatum 0.2 mm longum exeunte, in parte ventrali in appendices 1.2-1.5 mm longos exeunte, appendiculis subdivergentibus instructa. *Ovarium* pro $\frac{1}{2}$ longitudinis calycis tubi perfecte adnatum, loculi 8. *Stylus* 3-3.5 mm longus, glaber, filiformis, stigmate punctiformi munitus. *Capsula* subglobosa, 2.5 mm $\times$ 2 mm, dense glandulosa.

A small shrub, up to $\frac{1}{2}$ m in height. *Branches* terete, angular when young, dense-

ly glandulose puberulous. *Leaves* opposite, subequal, elliptic lanceolate, 7-13 cm $\times$ 1.5-3 cm, base cuneate, apex acute-acuminate, margin entire, upper surface sparsely glandulose or glabrate, undersurface densely glandulose, 3-5 nerved, veins reddish, transverse venules distinct on the undersurface, membranaceous; petiole 3-8 mm long. *Inflorescence* axillary, subfasciculate, few flowered, glandulose, about 1 cm long; pedicel 4.5-5 mm long. *Calyx-tube* campanulate, 2.5-



Neodriessenia rubrovenia Nayar sp. nov.

Fig. 1. A. Branch with leaves. B. Stamen. C. L. S. of the calyx tube.

2.8 mm long, densely glandulose, limb minutely 4-lobate, 0.3-0.4 mm long. *Petals* 4, oblong, c. 2 mm long, white (ex collector). *Stamens* 8, subequal, filament 2.8-3 mm long, anther oblong-lanceolate, 2-2.5 mm long, apex rostrate-acuminate, connective dorsally ends in a tubercle 0.2 mm long, ventrally ends in 1.2-1.5 mm long appendage, append-

age subdivergent. Ovary adnate to the calyx tube up to the middle. Style 3-3.5 mm long, glabrous, filiform, stigma punctiform. Capsule subglobose, 2.5 mm × 2 mm densely glandulose.

Distribution: Borneo (endemic). Borneo. Sarawak. Kapit Dist., Be'aga sub. dist., left bank of Rajang river, near Belaga airfield, alt. below 500 m, 20 Aug. 1958, *Jacobs* 5191 (K).

Neodriessenia scorpioidea (Stapf) Nayar comb. nov. *Driessenia scorpioidea* Stapf in Hook. f. Ic. Pl. 25, t. 2414. 1895; Merrill in Journ. Str. Br. Roy. As. Soc. 440. 1921. *Campimia scorpioidea* (Stapf) Ridley in Journ. Str. Br. Roy. As. Soc. 57: 40. 1911. *Type*: Borneo, *Haviland & Hose* 3222 (Holotype K, Isotypes BM, CAL).

Shrub. Branches quadrangular, densely glandular puberulous. Leaves opposite leaves somewhat unequal, widely ovate or ovate-rotund, 10-19 cm × 9-17 cm, base obscurely cordate or rounded, apex acuminate, margin entire, upper and undersurface densely glandulose, 7-9 nerved, cross-venules distinct, uppersurface dark green when dry, undersurface pallid green when dry; petiole 2.5-6 cm long, compressed, uppersurface canaliculate, glandulose-furfuraceous. Inflorescence paniculate and flowers arranged in a scorpioid manner, terminal or axillary. 5-12 cm long, densely glandulose and puberulous; pedicel 0.8-1.2 mm long, thickened when old. Calyx tube tubulose-campanulate, 2.5-3 mm long, densely glandulose-puberulous, calyx limb undulate or subtruncate. Petals rotundate-obovate, 2-2.5 mm × 2 mm. Stamens 8, subequal, filament 2.5 mm long, anther 2-2.5 mm long, oblong, dorsally ending in a spur 0.5 mm long, ventrally ending in an appendage with divergent apex 1.5 mm long. Ovary 1/3 the length of the calyx tube, disc present. Style filiform, 5-6 mm long, stigma punctiform. Capsule globose, 3.5-4 mm × 3.5 mm, apex constricted, 4-valved, pedicel 2 mm long,

thickened. Seeds cuneate, 0.4 mm long, numerous.

Distribution: Endemic to Borneo. Borneo. Sarawak. Niah, May 1892, *Haviland & Hose* 3222 (K, BM CAL); Baram, 28 Oct. 1894, *Hose* 218 (K); Ibid., Dec. 1894, *Hose* 466 (K, BM); Mt. Trekan, alt. 666 m, July 1895, *Hose* 16 (BM); Marudi, 17 June 1895, *Collector unknown* (BM); Indonesian Borneo: W. Koetai, No. 30, near L. Soeh, alt. c. 300 m, 3 Sept. 1925, *Endert* 4003 (K); Ibid., No. 30/31, near Bolzet, alt. c. 300 m, 3 Sept. 1925, *Endert* 4005 (K).

Neodriessenia crystallina (Stapf) Nayar comb. nov. *Driessenia crystallina* Stapf in Hook. f. Ic. Pl. 25, t. 2414. 1895; Merr. in Journ. Str. Br. Roy. As. Soc. 439. 1921.

Type: Borneo, *Haviland* 128 (Holotype K). Shrub. 1 m in height. Branches quadrangular, densely glandulose and puberulous. Leaves opposite leaves subequal, ovate or ovate-elliptic, 8-12 cm × 4-6 cm, base cuneate, apex acuminate, margin entire, 3-5-nerved, uppersurface glandulose, undersurface densely glandular; petiole 2.5-4.5 cm long, compressed, uppersurface canaliculate, densely glandular. Inflorescence panicle, flowers arranged in a scorpioid manner, axillary and terminal, 5-7 cm long, densely glandulose; pedicel 3-5 mm long, slender. Calyx tube tubular-campanulate, 3-3.5 mm long, densely glandular, limb undulate. Petals 4, rotundate-obovate, 2.5 mm long. Stamens 8, subequal, filament 3 mm long, anther 2.5 mm long, dorsally ending in a spur 0.5 mm long, ventrally ending in an appendage with divergent apex 1.5 mm long. Ovary 1/4 of the length of the calyx tube. Style filiform, 6 mm long, stigma punctiform. Capsule urceolate globose, 3.5-4 mm × 3 mm, apex constricted, 4-valved. Seeds cuneate, 0.4 mm long, numerous.

Distribution: Borneo (endemic) Borneo. Sarawak. Sarawak river, Bongsitu, alt. 266 m, *Haviland* 128 (K).

This is closely allied to *N. scorpioidea* but differs in the size of leaves and inflorescence. In *N. crystallina* the leaves have cuneate base and acuminate apex, the pedicel and the calyx tube are longer.

***Neodriessenia purpurea* Nayar sp. nov.**

N. hirtae (Ridl.) Nayar affinis, sed foliis oppositis aequalibus, vel subaequalibus, purpureis, inflorescentiis haud setosis differt.

Type: Borneo., *Collenette* 853 (Holotype K).

Herba 1 m alta. (teste collectoris). *Rami* quadrangulares, glandulosi. *Folia* opposita, subsessilia vel sessilia, elliptica vel oblongo-elliptica, 12-18 cm × 5-8 cm, subcoriacea vel chartaceae, basi subauriculata, apice acuminata, supra in sicco purpurea, sparse glandulosa, subtus dense glandulosa, 5-7 nervia, venulis transversis distinctis, reticulatis ornata. *Inflorescentia* paniculata, 5-7 cm longa, dense glandulosa. *Flores* 4-meri; pedicellus 3 mm longus, glandulosus. *Calycis* tubus campanulatus, 3-3.5 mm longus, glandulosus, limbus 4-dentatus. *Petala* rotundato-obovata, 2.5 mm × 1.5 mm. *Stamina* 8, subaequalia, filamentis 3-3.5 mm longis, antheris 2.5-3 mm longis, connectivo dorso in calcar 0.3 mm longum exeunte, in parte ventrali in appendices 1.5-2 mm longas exeunte, appendiculis subdivergentibus instructa. *Ovarium* coronatum, lobis minute denticulatis minutum. *Stylus* filiformis, 4.5-5 mm longus, glaber, stigmatibus haud conspicuis. *Capsula* subglobosa, 3 mm × 3.5 mm, glandulosa, quadrivalvis. *Semina* minuta, numerosa, 0.7 mm longa, cuneata.

Herb. 1 m in height (ex collector). *Branches* quadrangular, glandulose. *Leaves* opposite, subsessile or sessile, elliptic or oblong elliptic, 12-18 cm × 5-8 cm, base subauriculate, apex acuminate, upper surface when dry purplish, sparsely glandulose, undersurface densely glandulose, 5-7 nerved, transverse venules distinct, reticulate, subcoriaceous or chartaceous. *Inflorescence* paniculate, 5-7 cm long, densely glandulose. *Flowers* 4 merous; pedicel 3 mm long, glandulose. *Calyx tube* campanulate, 3-3.5 mm long, glandulose, limb 4-dentate. *Petals* rotundate-obovate, 2.5 mm × 1.5 mm. *Stamens* 8, subequal, filament 3-3.5 mm long, anther 2.5-3 mm long, connective dorsally calcarate, ventrally ends in 1.5-2 mm long appendage, appendage subdivergent. *Ovary* disc present, lobes minutely denticulate. *Style* filiform, 4.5-5 mm long, glabrous, stigma not conspicuous. *Capsule* subglobose, 3 mm × 3.5 mm, glandulose, quadrivalved. *Seeds* minute, numerous, 0.7 mm long cuneate.

Distribution: Borneo (endemic). Borneo. Sarawak: Bukit Bangai, Ulu Lamanak, alt. 1000 m, 26 Oct. 1961, *Collenette* 853 (Holotype K).

Neodriessenia purpurea is allied to *N. hirta* but differs in its non setose inflorescence and in its purplish leaves. Besides the opposite leaves are unequal in *N. hirta*; whereas in *N. purpurea* the opposite leaves are subequal.

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