Resurrection of the genus *Botrydium* Spach (Chenopodiaceae), with a description of four new species from China, Peru and Burundi

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**A B S T R A C T**

Based on specimens from twenty-one herbaria from China and USA, as well as observations using SEM, the genus *Botrydium* is resurrected as *Neobotrydium*. It has a number of distinctive characters: the plants are covered with granular hairs and granulated globular gland-grains, strong smell, and dichasia. *Neobotrydium* is removed from *Chenopodium*. The differences between *Neobotrydium* and *Chenopodium*, as well as circumscriptions of five glandular genera, *Neobotrydium*, *Cyclolema*, *Rouhieva*, *Ambrina*, and *Dysphania* are discussed. *Neobotrydium* comprises twenty species which occur in Asia, Europe, North Africa, North America to Northwest of South America and Australia. Four new species are described: *Neobotrydium corniculatum* and *Neobotrydium ornithopodum* from China, *Neobotrydium peruensis* from South America, and *Neobotrydium burundensis* from Africa. A diagnostic key is presented.

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1. Introduction

In *Chenopodium* there are some glandular species, which were first divided into the genus *Botrydium* Spach (1836), even though that is an illegitimate name (non Wallroth 1815 alga); two species were included into *Botrydium*: *Botrydium aromatum* Spach (=*Chenopodium botrys* Linn.) and *Botrydium scharderi* Spach (=*Chenopodium foetidum* Schrad., 1808, nom. Illeg. Non Lam. 1779). Small (1933) later transferred *Ch. botrys* (Linn.) Small into *Botrydium*. At the same time, Spach (1836) described the genus *Ambrina* Spach, also consisting of two species from South and Central America: *Ambrina pinnatisecta* Spach (=*Chenopodium multifidum* Linn. and *Rouhieva multifida* (Linn.) Moq.) and *A. ambrosioides* Spach (=*Chenopodium ambrosioides* Linn.). However, *Botrydium* and *Ambrina* have not been accepted by many taxonomists (e.g. Boissier, 1879; Bunge, 1862, 1880; Standley, 1916; Ulbrich, 1934; Iljin, 1936; Tutin, 1964; Grubov, 1966, Kung and Tsien, 1979, Wilson, 1984; Kühn, 1993; Zhu et al., 2003). Moquin-Tandon (1840, 1849) included *Ambrina* in his *Chenopodium* monograph, but transferred *Botrydium aromatum* into *Ambrina*, and placed *A. pinnatisecta* Spach (nom. Illeg.) into the new genus *Rouhieva* Moq, as *R. multifida* (Linn.) Moq. In short, the circumscription and relationship of these glandular groups remains unclear.

In light of molecular evidence (Kadereit et al., 2003), subfamily Chenopodioidae includes four groups (tribes), Chenopodieae I, Chenopodieae II, Chenopodieae III and Atripliceae. *Chenopodium* has been shown to be a non-monophyletic group, with different species scattered among Chenopodieae I, Chenopodieae II, and Chenopodieae III. *Ch. botrys* and *Ch. cristatum* belong to the glandular groups located in Chenopodieae III, and are related to *Dysphania*, *Teloxys*, *Axyris* and *Krascheninnikovia*.

In order to clarify the diversification of glandular groups and ascertain the circumscription of some genera, we conducted a morphological observation using scanning electron microscope (SEM). Furthermore, a classification of the glandular group *Botrydium* (*Chenopodium-Botrydium*) is presented on the basis of specimens from twenty-one herbaria.
2. Material and methods

Scanning electron microscopy was used to observe the surface of the glandular Chemopodioidae (Botrydium, Cycloloma, Roubieva, Ambrina and Dysphania) in order to determine their distinct morphology.

Specimens were examined from the following herbaria: USA ASC, BRY, CAS, COLO, CS, DAV, GH, IDO, MO, NY, RM, TEX, UC, China PE, NWTC, HNWP, LZU, WUK, CDBI and SZ, and Australia CANB (see Fig. 1).

3. Results and discussion

The present study supports the separation of two Eurasian species, C. foetidum and C. botrys, from Chenopodium. These two species possess a series of distinctive characters. Both species are covered with glandular hairs or gland-grains, or both; the shape of the gland-grains are always yellow granulated globular (Fig. 2A–C). Both species have a strong smell, which is suitable for entomophily pollination. Both species have inflorescences that are primitive dichasia (Cronquist, 1981) and seeds that are usually horizontal.

Chenopodium L., with more than 200 species and C. album L. as its type, have neither gland-grains nor glandular hairs; their trichomes are a kind of single-cell vesicular white water-hairs (furfuraceous) (Fig. 2G). They have glomerule glands which can support entomophilous pollination processes. Therefore, based on the characters above, we suggest Botrydium is a valid taxon that includes 20 species which occur in the temperate regions of Eurasia, North Africa, North America, Central America to northern Mexico; Roubieva Moq., glomerule its gland-grains are ellipsoidal, the seed is vertical, the type is Roubieva multifidum (Linn.) Moq., and it is distributed only in South America along with Roubieva bonariensis Hook.f. and around 5–7 further species; Dysphania R. Br., glomerule is with gland-grains rounded-globular (Fig. 2D), its c. 10 species are endemic to Australia.

4. Taxonomic treatments

Diagnostic key to Neobotrydium and related genera

1a. Plants covered with gland-grains or glandular hairs, or both; usually with a specific smell; no single-celled vesicular white water-hairs (furfuraceous) ------------------------------- Chenopodium

2a. Flowers in a dichasium
3a. Perianth dorsal no horizontal wing-shape appendages, sometimes with vertical keel-shape tubercle ---------------- Neobotrydium
3b. Perianth dorsal with horizontal wing-shape appendage --------------------------------------------- Cycloloma

2b. Flowers in a glomerule
4a. Gland-grains elliptic
5a. Seed vertical; perianth only lobed at apex ----------- Roubieva
5b. Seed horizontal; perianth parted near to base ---- Ambrina
4b. Gland-grain rounded-globular --------------------- Dysphania

Neobotrydium Moldenke, Amer. Midl. Naturalist 35: 330 (1946)
Botrydium Spach, Hist. Veg. Phan. 5: 298, 1836. nom. illeg.
TYPE SPECIES: Neobotrydium botrys (L.) Moldenke [=Chenopodium botrys Linn. =Botrydium aromaticum Spach and Botrydium botrys (L.) Small].

Annual herbs, covered with glandular hairs, or yellow granulated globular glands or both; with strong odour. Leaves

Fig. 1. Distribution of Neobotrydium corniculatum (triangles) and Neobotrydium ornithopodum (circles) in China. The provinces: XZ = Xizang, YN = Yunnan, SC = Sichuan, QH = Qinghai, GS = Gansu, NX = Ningxia, SX = Shanxi, HB = Hebei.
complanate, alternate, margins lobed or parted, or dentate. Dichotomous cymes. Flowers bisexual, perianth nearly globular, 1–1.5 mm diameter, 5 or 4-parted, segments ovate to narrow-ovate, with membranaceous narrow margins, sometimes with longitudinal keels; stamens 5, filaments compressed, anther nearly globular. Utricle depressed globular, pericarp membranaceous, adnate to seeds. Seeds usually horizontal, rarely vertical, testa thin-crustaceous, red-brown to black, lustrous; embryo half-annular or

Fig. 2. Trichomes of Neobotrydium and related genera (SEM): a) glandular hairs of Neobotrydium botrys; b) gland-grains of Neobotrydium peruense; c) gland-grains of Neobotrydium corniculatum; d) gland-grains of Dysphania plantaginella; e) gland-grains of Cycloloma atriplicifolium; f) gland-grains of Ambrina ambrosioides; g) water-hairs (furfuraceous) of Chenopodium opulifolium; h) gland-grains of Neobotrydium graveolens.
Hippocrepiform, surrounding farinaceous perisperm. Ca. 20 species distributed in Asia, Europe, North Africa, North and Central America, north-west region of South America and Australia.

1. *Neobotrydium corniculatum* G.L. Chu et M.L. Zhang, sp. nov.

**Fig. 3**

**TYPE:** G. L. Chu 15618, date of collection, China, Gansu, Diebu Xian, Wangzang, on foot of slopes (Holotype, NWTC).

Herba annua, 30–50 cm alta, obtegens glandulosa, odora. Caulis erectus, sparsim ramosus a basi ad apicem, viridis vel purpureorubellus, costati; rami oblique ascendentes, tenues. Folia alterna, petiolata; circumferentia laminae ovata, 2–5 cm longa, 1–3 cm lata, prope pinnatisecta; pinnula ovato-oblonga usque elliptica, inaequalis, margine plerumque pinnatifida vel dentata, abaxialis velata globulosus granulosus luteis glandula, adaxialis velata brevis pilis; petiolus 3–15 mm longus, tenuis. Dichasia axillaria et terminalia, 2–5 cm longa, patentes. Flores bisexual et female, perianthium sub globosum, ca 1 mm diam., 5-partitum; segmenta perianthii, leviter succuulenta, circa 0.9 mm longa, fructificatione dorsalis prope apicem 1 corniculatis appendicibus; stamina 5, filamentis linearis, cum segmentis fere aequilongi, antheris obovato-oblongis; stigma 2, filiformis; stylus obscurus. Utriculus: pericarpio membranaceo, ad semen adpressum. Semina compresse globulosae, horizontalia, 0.7–0.8 mm diam., testa tenuiter crustacea, nigra; embryo hippocrepicus, perispermo farinaceo. Proximum *Neobotrydium schraderium* quae differt foliis pinnatis et segmentis perianthii fructicatione dorsalisit abque corniculatis appendicibus.

Annual herb, covered with gland-grains and gland-hairs throughout, with strong odor. Stem erect, 30–50 cm tall, sparsely-branched, green, or purple-reddish, ribbed; branches obliquely-ascending, slender. Leaves petiolate, blade ovate in outline, margin irregularly 2- or 1- pinnatisect, 2–5 cm long, 1–3 cm wide; pinnules ovato-oblong to elliptical, usually unequal, margin dentate or pinnatifid, with yellow granulated gland-grains adaxially and short gland-hairs abaxially; petiole 3–15 mm long. Dichotomous cyme axillary and terminal, 2–5 cm long, slightly spreading, flower bisexual and female, perianth compressed-globular, ca. 1 mm wide, 5-parted to near base, segments linear-oblong, slightly succulent, ca 0.9 mm long, glandular on back, near apex of back each develops a corniculate appendage in fruit; stamens 5, with filiform filaments, slightly widen out to base, nearly equal in length to segments. Utricle: pericarp membranaceous, adnate to seed. Seed compressed globular, horizontal, 0.7–0.8 mm in diameter, testa thin-crustaceous, black at maturation; embryo annular, perisperm farinaceous. Flowering and fruiting period: August–October. Its distribution is depicted in Fig. 4.

**Representative specimens examined**

**China.** Gansu: Lanzhou, Aganzhen, G.L. Chu 179 (NWTC); Zhouqu Xian, Jiaoerqiao, alt. 1800 m, field margins, Z.P. Wei 2391 (NWTC, WUK); Yongdeng Xian, Liancheng, in woods, alt. 2999 m P.Q. Zhong 10147 (NWTC, WUK); Yongdeng Xian, Liancheng, in woods of *Betula*, alt. 2200–2600 m, P.Q. Zhong 10107 (PE); Lintan Xian, Yang-Sha, alt. 2600 m, W.Y. Hsia 8619 (WUK). Sichuan: Mao Xian, Meadow slopes, Z. He & Z.L. Zhou 13852 (PE, SZ); Songpan Xian, Heiqeqiao, alt. 1600 m, valley, roadsides, T.P. Wang 7939 (PE, WUK); Nanpin Xian, Wandwa areas, meadows, collector unknown 0996 (SZ).

Fig. 3. *Neobotrydium corniculatum* G.L. Chu et M.L. Zhang. 1: habit; 2,3,4,5: leaves; 6: flower; 7: stamen; 8: pistil; 9: cyme; 10: perianth in fruit; 11: utricle; 12: seed; 13: embryo.

Fig. 4. *Neobotrydium ornithopodum* G.L. Chu et M.L. Zhang. 1: habit; 2: stem; 3: cyme; 4: flower; 5: stamen; 6: pistil; 7: flower and fruit; 8: utricle; 9: seed; 10: embryo.
2. **Neobotrydium ornithopodum** G.L. Chu et M.L. Zhang, sp. nov.

**TYPE:** China, Gansu, Kangle Xian, Dangchuan xiang, Dahebalingchang, Xinfeng, slope thickets, alt. 1900 m, Y.S. Lian et al., 781196 (Holotype: NWTC).

Herba annua, 30–40 cm alta, oblongis glandulosa et glandularia, odora. Caulis erectus, ramosa a basi. Folia pelioliata; circumferentia laminae elliptica usque oblonga, 3–5 cm longa, 2–2.5 cm lata, apice acuta vel obtusa, basi cuneata, margine pinnatifidus; pinnulae inaequalis, leviter oblique, integeri vel lobate; petioli 1–1.5 cm longus. Dichasia axillaris, folia brevior, rhachidibus et ramulis flexuosis ornithopodum, dense glandulosis. Flores bisexualis; perianth nearly globular, 0.6–1 m m diam., testa tenuior crustacea, nigera in maturitas; embryophoricus, perispermo farinaceo.

Proximo Neobotrydium schraderianum sed axillaris dichasiis foliis breviorebus; rhachidibus et ramulis flexuosis; floribus dense ornithopodus, exuosus ornithopodus, dense glandulis. Flores bisexualis; perianth nearly globular, 0.6–1 mm diam., usually 5-parted, segments unequal, ovate-oblong, usually 5-partium; segmenta non apertus, inaequalis, ovata usque oblonga, oblongis glandulosis et longitudine carinae dorsum; stamina 5, filamentis linearibus; stylus obscurus; stigmata 2. Utriculus ovatus, pericarpio membranaceo, adpresso semen. Semen horizontale, 0.6–1 mm diam., usually 5-parted, segments unequal, ovate-oblong, longitudinally keeled and with short gland-hairs on back, not opening; style very short, stigma 2, filiform. Utricle with membranaceous pericarp, slightly brownish, adnate to seed. Seed horizontal, depressed, 0.6–0.7 mm diam., around margin obtuse, testa thin-crustaceous, black at maturation, slightly lustrous. Flowering and fruiting period: August–October. Distribution as in Fig. 4.

**Representative specimens examined**

**China:** Gansu, Diebu Xian Dianga South Mountain, alt. 2360 m, roadsides, Z.X. Peng 437 (LZU); Yuzhong Xian, Xinlong Shan, river marshes, alt. 2100 m, S.R. Wang 120 (LZU); Kangle Xian, Lulian, sunny mountain slopes, alt. 2100 m, Y.L. Liu et al., 76350 (NWTC); Xiahe Xian, Daba valley, Amqhu, meadows, alt. 2850 m, Gansu Public Health Bureau 206 (NWTC); Xiahe Xian, Qingshu, K.J. Fu 1101, alt. 2400 m (WUK).

**Hebei:** Xian, Longya Mountain, X.Y. Liu 15907 (NWTC); Wei Xian, Zhuolu Xian, Hsiao-wutaishan, alt. 1550 m, X.W. Kung 1174 (WUK); Cholu Xian, Ling Shan Kou, alt. 1700 m, W.Y. Hsia 2191, alt. 2191 m, J.X. Yang 5475 (WUK).

**Ledu Xian, Caotai forest-centre, Z.H. Wu & Y.S. Chen 018 (WUK).**

**Neobotrydium botrys** (L.) Moldenke, *Amer. Midl. Naturalist* 35: 330 (1946)

**Botrydium botrys** (L.) Small in *Fl. 466.1933.*

**Botrydium aromaticum** AMBR. *Enum.* 37: 1840. *Ambrina botrys* (L.) Moq. *Enum.* 37. 1840. *Botrydium botrys* Linn. *Sp. Pl.* 219. 1753; Reichb. *C. Germ.* 34; t250, f. 1–9.1909; Standley in *N. Am. Fl.* 21: (1); 26. 1916. *Iljin in Fl. URSS* 6: 46.1936; *Grubov, Pl. Asiae Centr.* 2: 19. 1966. Kung et al. in *Fl. Reip. Popul. Sin.* 25(2): 81. *Dysphana botrys* (Linn.) Mosyakin & Clemants, in *Ukrayins*’*K* Bot. Zhurn., n.s. 59: 383. 2002; *Fl. North Am.* 4: 273. 2003; 5: 377. 2003.

**Distribution:** Eurasia.

**Neobotrydium foetidum** (Schrad.) M.L. Zhang et G.L. Chu, nov. comb.

**C. foetidum** Schrad. Mag. Neuesten Entdeck. Gesammten Naturk. Ges. Naturf. Freunde Berlin 2: 79. 1808; *C. foetidum f. pumilum* Kurzt in R.E. Fr.; *Chenopodium graveolens* Wild. *f. pumilum* (Kurtz ex R.E. Fr.) Aellen *Verh. Naturf. Ges.* Basel 41: 108. 1931.

**Distribution:** N. SW. China, Europe, C. America.

**Neobotrydium schraderianum** (Roem. et Schult.) M.L. Zhang et G.L. Chu, nov. comb.

**Chenopodium schraderianum** Schult. in Roem. et Schult. *Syst. Veg.* Ed. 6: 260.1820. *Dysphania schraderiana* (Schult.) Mosyakin et Clemants, in *Ukrayins*’*K* Bot. Zhurn. 59: 383. 2002; *Fl. China* 5: 377. 2003.

**Distribution:** N. Somalia, Tanzania, Sandi Arabia, Kenya, Aethiopiea, Uganda, Ethiopia, Burundi to S. Africa.

**Neobotrydium incisum** (Poir.) M.L. Zhang et G.L. Chu, nov. comb.

**Chenopodium incisum** Ambr. *Enum.* 36. 1840. *Ambrina incisa* (Poir.) Moq. *Enum.* 36. 1840. *Chenopodium incisum* Poir. in Lam. *Encyc. Suppl.* 1: 392. 1810.

**Distribution:** Southwestern U.S.A.

**Neobotrydium dissectum** (Moq.) M.L. Zhang et G.L. Chu, nov. comb.

**Chenopodium dissectum** Moq. *Enum.* 38. 1840. *Chenopodium bipinnatifidum* Morex Moq. in *DC. Prodr.* 13(2): 76. 1849.
Teloxys ambrosioides (L.) Mosyakin & Clemants Ukrayins'k. Bot. Zhurn. 59(4): 382 (2002); Teloxys ambrosioides (L.) W.A.Weber Phytologia 58(7): 477 (1985); Blitum ambrosioides (L.) Beck Icon. Fl. Germ. Helv. (H.G.L. Reichenb) 24: 118. 1908; Botrys ambrosioides (L.) Nieuwl. Amer. Midl. Naturalist 3: 275. 1914; B. ambrosioides (L.) Beck Icon. Fl. Germ. Helv. (H.G.L. Reichenb) 24: 118. 1908. 

Distribution: Central America.

9. **Neobotrydium ambrosioides** (L.) M.L. Zhang et G.L. Chu, nov. comb.

C. ambrosioides L. Sp. Pl. 1: 219. 1753; Dysphania ambrosioides (L.) Mosyakin & Clemants Ukrayins'k. Bot. Zhurn. 59(4): 382 (2002); Teloxys ambrosioides (L.) W.A.Weber Phytologia 58(7): 477 (1985); Blitum ambrosioides (L.) Beck Icon. Fl. Germ. Helv. (H.G.L. Reichenb) 24: 118. 1908; Botrys ambrosioides (L.) Nieuwl. Amer. Midl. Naturalist 3: 275. 1914; B. ambrosioides (L.) Beck Icon. Fl. Germ. Helv. (H.G.L. Reichenb) 24: 118. 1908. 

Distribution: Central America.

10. **Neobotrydium procerum** (Hochst. ex Moq.) M.L. Zhang et G.L. Chu, nov. comb.

Chenopodium procerum Hochst. ex Moq. in DC., Prodr. 13(2): 75 (1849). 

Distribution: Northern Somalia.

11. **Neobotrydium pusillum** (Hook. f.) M.L. Zhang et G.L. Chu, nov. comb.

Chenopodium pusillum Hook. f. Handb N. Z. Fl. 231. 1864. 

Distribution: New Zealand.

12. **Neobotrydium graveolens** (Lag. et Rodr.) M.L. Zhang et G.L. Chu, nov. comb. C. graveolens Lag. et Rodr. Anal. C. Nat 5: 70. 1802. C. incisum Poir (1810) Encycl. (Lamarck) Suppl. 1. 392. 1810. 

Dysphania graveolens (Willd.) Mosy. & Clem. in Ukrayins'K. Bot Zhurn., n. s. 59:383.2002; Fl. North Am. 4:273. 2003. comb. illeg. 

Distribution: North America to Mexico and Bolivia.

13. **Neobotrydium pumilio** (R. Br.) M.L. Zhang et G.L. Chu, nov. comb.

Ambrina pumilio (R. Br.) Moq., Chenop. Monogr. Enum. 42. 1840. Chenopodium pumilio R. Br. Prodr. 407.1810. 

Dysphania pumilio (R. Br.) Mosy. & Clem.in Ukrayins'K. Bot Zhurn., n. s. 59:382. 2002. 

Distribution: Southern Australia.

14. **Neobotrydium carinatum** (R. Br.) M.L. Zhang et G.L. Chu, nov. comb.

Ambrina carinata (R. Br.) Moq. Monog. Chenop. Enum. 38. 1840. Chenopodium carinatum R. Br., Prodr. 407. 1810. 

Dysphania carinata (R. Br.) Mosy. & Clem.Ukrayins'K. Bot Zhurn., n. s. 59:382. 2002. 

Distribution: eastern Australia.

15. **Neobotrydium melanocarpum** (J.M. Black) M.L. Zhang et G.L. Chu, nov. comb.

C. carinatum var. melanocarpum J.M. Black, Trans et Proc. Roy. Soc. S. Australia 46. 566. 1922. 

Distribution: Australia.

16. **Neobotrydium saxatile** (Paul G. Wilson) M.L. Zhang et G.L. Chu, nov. comb.

Chenopodium saxatile Paul G. Wilson Nuytsia 4: 179.1983. 

Distribution: Australia.

17. **Neobotrydium peruense** G.L. Chu & M.L. Zhang sp. nov. Fig. 5 

TYPE: Peru, Prov. Lambayeque, Entre Chiclayo Procedencia, Lambayeque, Borde de Carretera, alt. 30 m, 18 Feb. 1982, S. Llatas Q841 (holotype MO). S. America. 

Herba annua, 15–20 cm alta, obtegens glandulae, odorata. Caulis erectus or ascendens. Folia complanata, alterna, petiolata; laminae ovato-elliptica, 2–4 cm longa, 3–10 mm lata, margine pinnatiloba; lobuli repandi, obtusi; petioli 2–7 mm longus. Dichasia axillaria, abbreviata, ca. 1 cm longa, patentia, breviora folio. Flores bisexuales; perianthium sub globosum, ca 1 mm diam., 4-partium; antheris ca. 0.2 mm longa Utricus, pericarpio membranaceo, adpresso semen. Semen horizontale compresso globulosum, ca 0.5 mm diam., testis tenuiter crustaceis rubri-brunneis lucensibus; embryo hippocrepicus, perispermo farinaceo.

Proximum Botrydium graveolenf! Lag. sed perianthii plerumque 4-partis; axillaria dichiasi abbreviata, foliis brevioribus et non sterilibus terminalibus ramulis differt.

Annual herbs, 15–20 cm high, covered with gland-grains, odoriferous. Stem erect or ascending. Leaves complanate, alternate, petiolate; blade ovate-elliptical, 2–4 cm long, 3–10 mm wide, with pinnatilobate margin, 1 lobes obtuse, repand; petiole 2–7 mm long. Dichasium axillar, shorter than leaves, ca. 1 cm long; flowers bisexual, perianth nearly globular, ca. 1 mm in diameter, usually 4-parted, densely covered with gland-grains; anther ca. 0.2 mm long. Utricle: pericarp membranaceo. Seeds horizontal, compresso globular, ca. 0.5 mm diam. testa thinly crustaceae, red-brown at maturity, smooth, glossy; embryo semi-annular, perispermo farinaceo.

**Representative specimens examined** 

Peru: Prov. Pacasmayo, Dpto, La Libertad, 10 Jun. 1983, I. Sanchez V.3089 (MO). 

Distribution: Peru.

18. **Neobotrydium cristatum** (F.Muell.) M.L.Zhang & G.L.Chu, comb. nov.

Blitum cristatum F. Muell. Trans. & Proc. Philos Inst Victoria 2: 73. 1858. 

Chenopodium cristatum (F.Muell.) F.Muell., Fragm. 7:11. 1869. 

Distribution: Australia.

19. **Neobotrydium truncatum** (Paul G. Wilson) M.L. Zhang et G.L. Chu, comb. nov. 

Chenopodium truncatum Paul G. Wilson Nuytsia 4: 177. 1983. 

Distribution: Australia.

20. **Neobotrydium burundienne** G.L. Chu et M.L. Zhang & sp. nov. 

TYPE: Burundi, Zaire (Belgian Congo), alt. 5500 ft, Idjw, Is. Lake Kivu, 24 Feb. 1939, M. V. Loveridge 587 (holotype MO).

Herba annua, obtegens glandulae, odorata. Caulis erectus, sparsim. ramosus. Folia complanata, alterna, viridis petiolata; laminae oblonge-lanceolata, 3–4 cm longa, 1–1.5 cm lata, margine lobata; lobuli dentatis, obtusis; petioli 2–7 mm longus. Dichasia axillaria et terminalia, abbreviata, breviora folio. Flores bissexuales; perianthium oblongum, ca 1.2 mm diam., plerumque 4-partum ad basim, segmentis rotundis vel ovatis, inaequalibus, leviter cucullatis ad apicem; antheris ca. 0.3 mm longa Utricus, pericarpo
membranceo, Semen verticalia compresse-ovoideum, ca. 1 mm diam., testis tenuiter crustaceis, denigratis lucentibus; embryo hippocrepicus, perispermo farinaceo.

Proximum Botrydium schraderianum Schult., Neobotrydium schraderianum sed perianthiis plerumque 4-partis; Semene verticali differt.

Annual herb, covered with glands throughout. Stem erect, sparsely branched, green, leaves complanate, petiolate, blade oblong-lanceolate in outline, 3–4 cm long, 1–1.5 cm wide margin lobed, lobes dentate. Dichasium axillary and terminal, shorter than leaves. Flower bisexual, perianth oblong, ca. 1.2 mm in diameter, usually 4-parted to near base, segments rotund to ovate, unequal in size, apex slightly cucullate; anther ca. 0.3 mm long. Utricle: pericarp succulent rotund to ovate, with testa thinly crustaceous, black at maturity; embryo nearly annular, perisperm, farinaceous.

Representative specimens examined
Burundi: Prov. Muramwy, Bugarama, alt. 2080 m, 28 April 1982, M. Reekmans 11051(MO); Prov. Gitega, jachere postculturale, alt. 2000 m, 13 May 1982, M. Reekmans 11227(MO).

Distribution: North Africa.

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Further Reading

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