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Two new species in *Pterostylis* (Orchidaceae) in Western Australia

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SHORT COMMUNICATION

Ongoing study of both living material and preserved specimens in the genus *Pterostylis* R.Br. in Western Australia has revealed a number of as yet undescribed species. Two of these, currently recognised by the Western Australian Herbarium under the phrase names *P.* sp. Murchison (C.J. French CJF 12549) and *P.* sp. Paynes Find (G. Brockman GBB 526), are formally described here as new.

Pterostylis argillacea G.Brockman & C.J.French, *sp. nov*.

Type: [East of Kalbarri] Western Australia [precise locality withheld for conservation reasons], 19 September 2018, *C.J. French* CJF 12549 (*holo*: PERTH 09183043).

Pterostylis sp. Murchison (C.J. French CJF 12549), Western Australian Herbarium, in *Florabase*, https://florabase.dbca.wa.gov.au/ [accessed 6 February 2024].

Illustrations. A.P. Brown, K.W. Dixon, C.J. French & G. Brockman, *Field Guide to the Orchids of Western Australia*, p. 380 (2013), as *P.* sp. Murchison; N. Hoffman, A.P. Brown & J. Brown, *Orchids of South-West Australia*, 4th edn, p. 425 (2019), as *P.* sp. Murchison; A.P. Brown, *The Complete Orchids of Western Australia*, vol. 2, p. 183 (2022), as *P.* sp. Murchison.

Terrestrial tuberous *herb* 120–180 mm tall, solitary. *Leaves* sessile, 7–10 in a basal rosette, prostrate, imbricate, entire, often withered at anthesis, 10–20 mm long × 8–12 mm wide, narrowly obovate, soft green with prominent veining. *Sterile bracts* 2, one basal, second mid scape, tightly clasping, 15–20 mm long × 5–7 mm wide when flattened, lanceolate, soft whitish green. *Scape* erect, 90–130 mm tall × 2–4 mm in diameter, glabrous, greenish brown basally to greenish white distally. *Pedicels* 10–25 mm long, erect then gently curved forward, soft green. *Ovary* straight, 5–8 mm long × 2–2.5 mm diameter, narrowly obovoid, longitudinally ridged, glabrous, soft green. *Flowers* 1–7, erect to semi-nodding, 32–38 mm long × 8–11 mm wide, translucent with red/brown and olive-green striping on the galea and red/brown synsepalum and labellum. *Galea* bulbous, glabrous, curved throughout body and gently decurved in the apical free point; petal margins conjoined throughout, flared laterally mid-length, translucent with longitudinal red/brown lines, sometimes red/green. *Dorsal sepal* cucculate, 25–35 mm long × 8–11 mm wide when flattened including apical free point, narrowly elliptic with a deflexed filiform apical free point 18–24 mm long, translucent with red/brown stipes. *Lateral sepals* mildly deflexed, conjoined part (synsepalum) as wide as the galea, concave laterally and longitudinally, ovate, 7–9 mm long × 3.5–4.5 mm wide when flattened, margins mildly involute, outer surface with sparse cilia, sinus narrow; apical free points filiform, parallel, 16–22 mm long, red/brown sometimes stained with green. *Petals* asymmetrical, ovate-lanceolate, falcate, 15–17 mm long including short apical free point, sparsely hirsute, margins thickened, apex a 2–3 mm acuminate point. *Labellum* nestled within the synsepalum in set position; claw 1–1.5 mm long × 1–1.5 mm wide, green; lamina elliptical-spathulate, completely covered with fine siliceous cells, 5–6 mm long × *c*. 2.5 mm wide, gently concave, with a vague central longitudinal ridge,

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constricted in the proximal one fifth, proximal lobe rudimentary, apex acute. *Labellum marginal setae* spreading obliquely, 8–10, 2–2.5 mm long and the entire margins with numerous short trichomes. *Column* porrect from the ovary, 10–12 mm long × *c*. 2 mm wide, incurved, green/white becoming solid green distally. *Column wings* obscurely rectangular laterally, 3–3.5 mm long × *c*. 2 mm wide; basal lobes ovate, ciliate; barrier trichomes monifiliform. *Anther* 1.5 mm long, obtuse. *Stigma* narrowly ovate, scutelliform, *c*. 5 mm × *c*. 2 mm. *Capsule* not seen. (Figure 1)

Diagnostic features. *Pterostylis argillacea* can be distinguished from all other members of the genus by the following combination of characteristics: basal rosette of leaves on flowering and non-flowering plants; flowers 32–38 mm long × 8–11 mm wide, translucent with red/brown and olive-green striping; cucculate galea with a gently decurved filiform free point to 24 mm long; narrowly spathulate labellum with 8–10 obliquely spreading setae; concave synsepalum with straight parallel filiform free points to 22 mm long.

Other specimen examined. WESTERN AUSTRALIA: [locality withheld for conservation reasons] 19 Sep. 2018, *C.J. French* CJF 12545 (PERTH 09183051).

Phenology. Flowering occurs throughout September.

Distribution and habitat. Restricted to the lower Murchison River area within the Kalbarri National Park and Murchison House Station, growing under low shrubs and mallee eucalypt woodlands in low depressions in damp clay loam, sometimes seasonally wet.

Conservation status. Recently listed as Priority Two under Conservation Codes for Western Australian Flora (Western Australian Herbarium 1998–), as *P.* sp. Murchison (C.J. French CJF 12549). Although locally common, the species has a restricted distribution, known from only three locations. However, both collections are from within a National Park. There is a report of this species from Beekeepers Nature Reserve near Eneabba, which is without voucher specimens and requires further research.

Etymology. The specific epithet is from the Latin *argillaceus* (growing on clay), alluding to the preferred habitat of the species in or around low, winter-wet, brown clay pans.

Common name. Murchison Rufous Greenhood.

Affinities. This species has affinities with *Pterostylis spathulata* M.A.Clem., but differs in having smaller red–brown flowers 8–11 mm wide *cf*. *P. spathulata* 12–14 mm wide, with smaller synsepalum 7–9 mm wide *cf*. *P. spathulata* 10–13 mm wide, and straight parallel lateral sepal free points *cf*. markedly upcurved and often crossed in *P. spathulata*. All other species within the *P. spathulata* group have larger flowers with wider synsepalum and are not found growing in wet clay habitat.

Pterostylis argillacea sometimes grows with *P. tryphera* (D.L.Jones & C.J.French) D.L.Jones & C.J.French but has larger flowers 8–11 mm wide *cf*. *P. tryphera* 5–7 mm wide and a spathulate labellum with a rudimentary glabrous proximal lobe *cf*. *P. tryphera* which has a narrowly elliptic to obovate labellum lamina with a densely ciliate proximal lobe equal to the lamina in width.

The distribution of *P. argillacea* overlaps that of *P. macrocalymma* M.A.Clem. & D.L.Jones but they have not been observed growing together. *Pterostylis argillacea* is smaller flowered, 8–11 mm wide *cf*. 10–15 mm wide in *P. macrocalymma* and has straight lateral sepals *cf*. upcurved lateral sepals in *P. macrocalymma*.

Figure 1. *Pterostylis argillacea*. A – plant *in situ* from Kalbarri; B – flower demonstrating labellum features in side view; C – flower demonstrating labellum features, front view. Images unvouchered. Photographs by G. Brockman (A, B) and C.J. French (C).

Pterostylis arida G.Brockman & C.J.French, *sp. nov*.

Type: North of Paynes Find, Western Australia [precise locality withheld for conservation reasons], 8 September 1999, *G. Brockman* GBB 526 (*holo*: PERTH 05534003).

Pterostylis sp. Paynes Find (G. Brockman GBB 526), Western Australian Herbarium, in *Florabase*, https://florabase.dbca.wa.gov.au/ [accessed 6 February 2024].

Pterostylis sp. scooped sepals (G. Brockman GBB 386), Western Australian Herbarium, in *Florabase*, https://florabase.dbca.wa.gov.au/ [accessed 1 May 2023].

Oligochaetochilus sp. scooped sepals (G. Brockman GBB 386), Western Australian Herbarium, in *Florabase*, https://florabase.dbca.wa.gov.au/ [accessed 6 February 2024].

Illustrations. A.P. Brown, K.W. Dixon, C.J. French & G. Brockman, *Field Guide to the Orchids of Western Australia*, p. 381 (2013), as *P.* sp. Paynes Find; A.P. Brown, *The Complete Orchids of Western Australia*, vol. 2, p. 181 (2022), as *P.* sp. Paynes Find.

Terrestrial tuberous *herb* 50–120 mm tall, solitary. *Leaves* sessile, 5–7 in a basal rosette, prostrate, entire, withered at anthesis, 10–20 mm long × 8–12 mm wide, narrowly obovate, margins with short translucent cilia, soft green with prominent veining. *Sterile bracts* 1 or 2, one basal, clasping scape, 15–20 mm long × 6–9 mm wide when flattened, broadly lanceolate, margins with short translucent cilia, soft whitish green. *Scape* erect, 30–80 mm tall × 3–5 mm diameter, glabrous, green/brown basally to greenish white. *Pedicels* 10–55 mm long, curved forward, soft green. *Ovary* straight, 5–8 mm long × 2–2.5 mm diameter, narrowly obovoid, longitudinally ridged, glabrous, soft green. *Floral bracts* erect, clasping the pedicel and base of flower, broadly navicular, margins with short translucent cilia, lamina soft green. *Flowers* 1–4, erect, 25–30 mm long × 7–9 mm wide, translucent with red/brown or soft green striping on the galea and brown/tan synsepalum, dark brown labellum. *Galea* bulbous, covered randomly with short white cilia, curved throughout body and gently decurved to straight in the apical free point; petal margins conjoined throughout, flared laterally mid-length, translucent with longitudinal red/brown or green lines. *Dorsal sepal* cucculate, 20–30 mm long × 8–11 mm wide when flattened including apical free point,

narrowly elliptic with a markedly reflexed filiform apical free point 10–12 mm long, translucent with red/brown or green/tan stipes. *Lateral sepals* mildly deflexed, conjoined part (synsepalum) as wide or slightly wider than the galea, shallowly concave laterally and longitudinally, ovate, 9–11 mm long × 3.5–4.5 mm wide when flattened, margins entire, outer surface covered with untidy translucent cilia to 1.5 mm becoming sparse toward the apical free points, sinus narrow; apical free points filiform, curving forward and together from the conjoined part, 11–14 mm long, red/brown sometimes stained with green. *Petals* asymmetrical, ovate lanceolate, falcate, 14–15 mm long including short apical free point, sparsely hirsute, margins thickened, apex a *c*. 1 mm long acuminate point. *Labellum* proudly exposed in set position; claw 1–1.5 mm long × 1–1.5 mm wide, green; lamina spathulate, completely covered with fine siliceous cells, 6–7 mm long × 2.5–3 mm wide, gently concave, constricted in the proximal one fifth, proximal lobe rudimentary, apex acute and gently curved forward. *Labellum marginal setae* spreading obliquely, 4–5 pairs, 2.5–3 mm long, the entire margins with numerous short trichomes. *Column* porrect from the ovary, 12–14 mm long × *c*. 2 mm wide, incurved, green/white becoming darker distally. *Column wings* obscurely rectangular, 4–5 mm long × 2–2.5 mm wide; basal lobe ciliate; barrier trichomes moniliform. *Anther c*. 1.5 mm long, obtuse. *Stigma* narrowly ovate, scutelliform, *c*. 5 mm × *c*. 2 mm. *Capsule* not seen. (Figure 2)

Diagnostic features. *Pterostylis arida* can be distinguished from all other members of the genus by the following combination of characteristics: plant height to 12 cm tall, basal leaves and bracts with short marginal cilia, synsepalum narrow (8–9 mm wide) with a shallowly concave dorsal surface with untidy translucent cilia becoming sparse toward the apical free points, apical free points filiform (11–14 mm long) curving forward and parallel; dorsal sepal free point filiform 10–12 mm long and markedly reflexed, broadly spathulate labellum with 4–5 pairs of moniliform lateral marginal setae, proximal lobe rounded and free of setae.

Figure 2. *Pterostylis arida*. A – plant from near North Yalgoo; B – flower from near Paynes Find. Images uvouchered. Photographs by G. Brockman.

Other specimens examined. WESTERN AUSTRALIA: [localities withheld for conservation reasons] 19 Aug. 1998, *G. Brockman* GBB 398A (PERTH 05320690); 16 Sep. 1998, *G. Brockman* GBB 384 (PERTH 05320631); 16 Sep. 1998, *G. Brockman* GBB 386 (PERTH 05320550); 16 Sep. 1998, *G. Brockman* GBB 388 (PERTH 05297303); 1 Sep. 1999, *G. Brockman* GBB 488 (PERTH 05533473); 2 Sep. 1999, *G. Brockman* GBB 494 (PERTH 05533929); 7 Sep. 1999, *G. Brockman* GBB 525 (PERTH 05534011); 10 Sep. 2013, *G. Brockman* GBB 3205 (PERTH 09153438); 20 Sep. 2005, *A. Markey & S. Dillon* 3964 (PERTH 07510578).

Phenology. Flowering occurs from mid-August through September.

Distribution and habitat. Currently known from on and around granite rock habitats in the northern goldfields from Bimbijy Station to Mount Magnet, where it grows in damper soil pockets under shrubs and soil-filled faults in the granite.

Conservation status. Recently listed as Priority Three under Conservation Codes for Western Australian Flora (Western Australian Herbarium 1998–), as *P.* sp. Paynes Find (G. Brockman GBB 526). The species is never common, but populations are scattered over a wide area. Current distribution is restricted to pastoral leases and conservation reserves from reclaimed leases. The species is restricted to low rainfall areas and threatened by overgrazing, changes to rainfall patterns, and mining activity.

Etymology. The specific epithet is from the Latin *aridus* (arid, dry or withered), alluding to the habitat.

Common name. Paynes Find Rufous Greenhood.

Affinities. *Pterostylis arida* has affinities with *Pterostylis spathulata* but differs in having shorter flowering plants 50–120 mm *cf. P. spathulata* 150–350 mm, fewer flowers 1–4 *cf. P. spathulata* 2–12, smaller flowers 25–30 mm long × 7–9 mm wide *cf. P. spathulata* 28–35 mm × 8–11 mm wide and a more northerly distribution.

Pterostylis arida has affinities with *P. tryphera* but has larger flowers 25–30 mm long × 7–9 mm wide *cf. P. tryphera* 20–25 mm long × 5–7 mm wide and a spathulate labellum *cf. P tryphera* with a narrow elongated labellum.

Neither *P. spathulata* nor *P. tryphera* exhibits the short ciliate margins on leaves and bracts present in *P. arida.*

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