

RESEARCH ARTICLE

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Taxonomy lies at the heart of species conservation, yet many large New Zealand orthopterans remain undescribed. Among New Zealand anostomatid wētā, *Hemiandrus* (ground wētā) is the most speciose genus but also the most poorly characterised and thus most in need of taxonomic and ecological work. Here we redescribe *H. maculifrons* and describe two new species of ground wētā previously encompassed by the species name *Hemiandrus maculifrons*: *Hemiandrus lunae* sp. nov. and *H. brucei* sp. nov. We also describe a morphologically similar and related species, *Hemiandrus nox* sp. nov.

and hind tibiae, and pronota were captured using the Olympus Image Analysis Software. Photographs of heads and whole specimens were captured using a Canon EOS 40D digital camera. Specimens from additional locations were examined to assess the distributions of each species and distributions were mapped with the software ArcMap from ArcGIS 10.1 (ESRI).

Prefixes: GW is used for ground water in the Phoenix Lab collection (Massey University, Palmerston North); DOCORD, DOC pitfall specimens; AMNZ, Auckland Museum specimens; NZAC, New Zealand Arthropod Collection specimens; FD is used for a single specimen collected by Eric Edwards (DOC) from Fiordland; MONZ, Museum of New Zealand

concave apical margin; adult male cerci blunt; male T9 bilobed with acute lobes; females with a very long, gently curved ovipositor.

Adult male (n = 15): PL 3.824.76 mm; PW 3.704.73 mm; FL 10.5313.93 mm; FW 2.803.66 mm; HL 4.825.99 mm; HW 3.434.26 mm; BL 7.208.94 mm; SG 1.912.61 mm; SG/PL 0.49.65; FL/HW 2.983.54. Adult female (Figure 2) (n = 63): PL 3.405.54 mm; PW 3.555.55 mm; FL 9.8915.70 mm; FW 2.724.13 mm; HL 5.066.96 mm; HW 3.364.88 mm; BL 6.8810.93 mm; OV 9.5815.10 mm; OV/FW 3.054.03; FL/HW 2.803.47. See Table 1

(Figure 3A). Shiny, darker brown on top with faint pale dorsal midline; gena cream or mottled cream and brown; frons and clypeus mottled, rugose; labrum cream and/or brown, setose; mandibles cream and brown, dark distally; scape, pedicel and antennomeres cream and light brown; antennae longer than body, flagella proximally smooth (12/14 antennomeres), distal antennomeres covered by short microsetae; eyes black; vertex with raised subtriangular fastigium; ocellar spots white; maxillary palps cream with bulbous apices and with widely spaced setae and covered by short microsetae (MP5 100% pilose, MP4 100%, MP3 c. 50%).

Pronotum, mesonotum and metanotum brown with a faint pale dorsal mid-line which extends from the head to the abdominal tergites; pronotum shiny and smooth dorsally, rugose ventrally, approximately as long as wide, large lateral pale patches and the dorsal area mottled with large pale patches (Figure 4). Thoracic sterna cream and/or

Head colouration A, *Hemiandrus maculifrons* sp. nov. B, *Hemiandrus lurs* sp. nov. C, *Hemiandrus brucei* sp. nov. D, *Hemiandrus nordensis* sp. nov.

Patterning of the pronotum varies both within and between species. A, *Hemiandrus maculifrons* sp. nov. B, *Hemiandrus lurs* sp. nov. (South Island). C, *Hemiandrus lurs* sp. nov. (North Island). D, *Hemiandrus brucei* sp. nov. E, *Hemiandrus brucei* sp. nov. F, *Hemiandrus nordensis* sp. nov. G, *Hemiandrus madisylvestris* sp. nov. H, *Hemiandrus nordensis* sp. nov.

tibiae with 13 cream articulated spines with brown tips arranged as follows: four apicals, one positioned medially on superior prolateral angle, none on superior retrolateral angle, four along the inferior prolateral angle, four along the inferior retrolateral angle. Mid tibiae with 17 cream articulated spines with brown tips arranged as

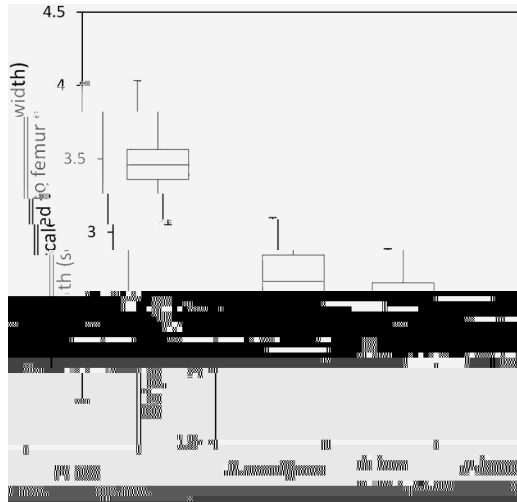
Male ninth abdominal tergites. Also visible are the falci, cerci and paracymbria. A, *Hemiandrus maculifrons* sp. nov. B, *Hemiandrus luns* sp. nov. C, *Hemiandrus brucei* sp. nov. D, *Hemiandrus n* sp. nov.

Adult female, collected February 2014 from Lewis Pass (BR) (! 42.324j, 172.1283j), BL Taylor-Smith and NB Smith (MONZ AI.033208; GW1021). Adult male, collected February 2014 from Lewis Pass (BR) (42.3786j, 172.2776j), BL Taylor-Smith and NB Smith (MONZ AI.033209; GW1011).

NN, BR, NC, MC, WD, FD, OL, CO, DN, SL, FD (Figure 9).

NN: Mt Arthur (GW670; GW790, DOCORD055928); Denniston (GW758, GW864, GW895); Flora Saddle (GW788, GW694); Te Kuha (GW1081); Mt

Male subgenital plates. A, *Hemiandrus maculifrons* sp. nov. B, *Hemiandrus luns* sp. nov. C, *Hemiandrus brucei* sp. nov. D, *Hemiandrus brucei* sp. nov. E, *Hemiandrus n* sp. nov.



Owen (GW214); Tasman Wilderness Area (GW215, GW2BR). Rolleston Track (GW872, GW873, GW874, GW875, GW876, GW877); Lewis Pass (GW461, GW462A, GW462B, GW463A, GW463B, GW1011, GW1017, GW1018, GW1019, GW1020, GW1021, GW1022, GW1025); Kaiata (GW920, GW921, GW922M, GW922F, GW923, GW924F, GW925F); Mt Sewell Track (GW1062); Braeburn Track (DOCORD048036); Paparoa Ranges (GW147, GW152, NZAC); Awatuna (GW824, GW825, GW826, GW827, GW828, GW829, GW830, GW831, GW832, GW835, GW836, GW837, GW839, GW840, GW861); Franz Josef (GW150); Haast (GW259, NZAC); Mahitahi

cream and/or light brown; each with two blunt spines which are long and thin on the prosternum and short and wide on the meso- and metasterna.

Long (hind femora 2.7 to 3.0 times head width); coxae and trochanters cream; fore and mid coxae with spinous lobes; femora cream at base becoming brown with cream spots; tibiae brown with cream spots; fore tibiae lacking tympanum. Fore tibiae with 13 cream articulated spines with brown tips arranged as follows: four apicals, one positioned medially on superior prolateral angle, none on superior retrolateral angle, four along the inferior prolateral angle, four along the inferior retrolateral angle. Mid tibiae with 17 cream articulated spines with brown tips arranged as follows: four apicals, two along the superior prolateral angle, three along the superior retrolateral angle, four along the inferior prolateral angle, four along the inferior retrolateral angle. Hind tibiae with 31 spines arranged as follows: two pairs of short apical spines, one pair of long apical spines, one pair of long subapical spines, 15 fixed spines along the superior prolateral angle, 15 fixed spines along the superior retrolateral angle, one (rarely two)

Long (hind femora 2.8 to 3.5 times head width); coxae and trochanters cream; fore and mid coxae with spinous lobes; femora cream at base becoming brown with cream spots; tibiae brown with cream spots; fore tibiae lacking tympanum. Fore tibiae with 13 cream articulated spines with brown tips arranged as follows: four apicals, one positioned medially on superior prolateral angle, none on superior retrolateral angle, four along the inferior prolateral angle, four along the inferior retrolateral angle. Mid tibiae with 17

Matawai (DOCORD059825); Whinray Scenic Reserve (DOCORD059901,
DOCORD059910).GB:

Hemiandrus brucei

superior prolateral angle, 106 fixed spines along the superior retrolateral angle, no small articulated spine on the ventral side of the tibia (Figure 1). Tarsi cream, setose, four-segmented, first segment with foot-pad divided into two, other segments with a single foot-pad. The fi

Flora Carpark (GW689, GW690, GW691, GW692, GW695, GW786); Mt Arthur (DOCORD055928); Brooklyn Valley (DOCORD056506); Harwoods Hole (AMNZ64052); Cobb Valley (GW95); Lake Hanlon (AMNZ5206)p"

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