NOTES ON STENOTUS AND NESTOTUS (ASTERACEAE: ASTEREEAE)

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ABSTRACT

The genus Nestotus is enlarged to three species with the addition of Stenotus lanuginosus, as Nestotus lanuginosus (A. Gray) Nesom, comb. nov. and Nestotus lanuginosus var. andersonii (Rydb.) Nesom, comb. nov. Stenotus pulvinatus is maintained as a member of Stenotus sensu stricto, a genus of three species (also including S. acaulis and S. armerioides). Illustrations of habit and diagnostic details are provided for species of each genus.

Molecular studies by Roberts (2002) and Roberts and Urbatsch (2003, 2004) showed that Stenotus as previously circumscribed (Rydberg 1900; Nesom 1989 and Morse 1998, as 6 species) is not monophyletic. Stenotus acaulis (the type) and S. armerioides, as sister species in the analyses, together are most closely related to Petrdoria (1 or 2 species) and Toiyabea (monotypic). Stenotus stenophyllus and S. macleanii show as sister species and were segregated by Roberts et al. (2005) as the genus Nestotus. Curiously, in the cladogram published by Brouillet et al. (2009), it is S. stenophyllus and S. macleanii that show as sister to Petrdoria and Toiyabea, and the positions of S. acaulis (Baja California) and S. armerioides (western USA and Saskatchewan) are unresolved.

The relationships of Stenotus lanuginosus and S. pulvinatus were not resolved in the molecular analyses by Roberts and colleagues (or by Brouillet et al.), but Roberts et al. (2005) maintained them within Stenotus. For the FNANM treatment, Stenotus was regarded as a genus of 4 species (Morse 2006), Nestotus as a genus of 2 (Urbatsch et al. 2006). The taxonomic positions of S. lanuginosus and S. pulvinatus are considered here.

1. STENOTUS LANUGINOSUS

A close similarity between Nestotus (Stenotus) macleanii (A. Gray) Urbatsch et al. and Nestotus (Stenotus) stenophyllus (Brandeg.) Urbatsch et al. was observed by Morse (1998), who placed Stenotus lanuginosus close to these, based on the common production of thin, stipitate-glandular leaves and stipitate-glandular, thin-herbaceous phyllaries of equal or subequal lengths in 2 series. All three species also have a mat-forming habit with solitary, yellow-rayed heads and narrow leaves, and N. stenophyllus and S. macleanii both produce at least small amounts of cobwebby vestiture.

Molecular analyses (Roberts 2002; Roberts & Urbatsch 2003, 2004; summarized by Roberts et al. 2005) place Nestotus macleanii and Nestotus stenophyllus as sister species but suggest that Stenotus lanuginosus is basal to a clade comprising Chrysothamnus, Amphipappus, Acamptopappus, Tonestus, Eastwoodia, Oreochrysum, and Lorandersonia. Only in a single morphological feature, however, is S. lanuginosus excluded from the generic description given by Roberts et al. (2005, 2006) for Nestotus — the linear leaves of N. macleanii and N. stenophyllus are 1-nerved, while the slightly wider leaves of S. lanuginosus are 3-nerved.

Molecular data may suggest that the evolutionary origin of Stenotus lanuginosus involved hybridization or introgression, perhaps apart from Nestotus macleanii and N. stenophyllus, but the strong morphological similarity among these three species supports a hypothesis of close common ancestry, and the third species is added here to Nestotus.
Nesom: *Stenotus* and *Nestotus* 2


a. *Nestotus lanuginosus* (A. Gray) Greene var. *lanuginosus*


**Key to the species of Nestotus**

1. Leaves linear-oblancoolate, 3-nerved, mostly 1.5–5 mm wide, longer, surfaces sparsely to moderately lanate ............................................. **Nestotus lanuginosus**

2. Leaf surfaces glabrous, eglandular, margins usually ciliate with short, stiffly spreading hairs

3. Stipitate-glandular, margins eciliate

**Nestotus macleanii**

2. Leaf surfaces hirsute to hirsutulous, often stipitate-glandular, margins eciliate

**Nestotus stenophyllus**

Figure 1. Generalized distributions of *Nestotus* species. *Nestotus macleanii* is endemic to central Yukon.
Figure 2. *Nestotus stenophyllus*, representative plants and heads. Above, photo by Paul Slichter, 20 Apr 2011, Washington.
Figure 3. Nestotus stenophyllus, representative plants.
Figure 4. *Nestotus stenophyllus*, leaf vestiture. Photo G.D. Carr, 2010. WTU
Figure 5. *Nestotus stenophyllus* involucre. Photo by Richard Spellenberg, 24 May 2015, California.

Figure 6. *Nestotus stenophyllus*, characteristic involucral morphology.
Figure 7. *Nestotus macleanii*. Photo by Syd Cannings, iNaturalist, 28 May 2011, Yukon Territory.

Figure 8. *Nestotus macleanii*. Characteristic habit.
Figure 9. *Nestotus macleanii*. Characteristic vestiture, stiffly ciliate leaf margins.

Figure 10. *Nestotus lanuginosus*. Photo by Paul Slichter, 28 June 2008, northeastern Oregon.
Figure 11. *Nestotus lanuginosus* Characteristic habit.
Figure 12. *Nestotus lanuginosus*, involucre. Photo by Paul Slichter, 2 June 2012, Steens Mountain, Oregon.
Figure 13. *Nestotus lanuginosus*, characteristic involucral morphology. Note similarity with that of *Nestotus stenophyllus*, Fig. 6.
2. **STENOTUS PULVINATUS**

*Stenotus pulvinatus* is an endemic of the Sierra de San Pedro Mártir in Baja California, where it grows in rocky habitats at 7500–9200 feet elevation. It has a mat-forming habit (from a taproot and woody, multipiptal caudex, often with long branches), narrow, coriaceous leaves with stipitateglandular vestiture, rayless, solitary heads on peduncles no longer than the basal leaves, and oblong-lanceolate phyllaries with acute apex, slightly thickened, in 3–4 series strongly graduate in length. The phyllaries have a herbaceous apical patch and white-indurate base. All of these features except the lack of ray flowers and consistently foreshortened peduncles are similar to those of at least some forms of *Stenotus acaulis*; peduncles of *S. acaulis* vary greatly in length.

No other North American species of Astereae beside *Stenotus acaulis* closely resembles *S. pulvinatus* and it seems a reasonable hypothesis that now-isolated *S. pulvinatus* originated as a variant of a once more widely distributed *S. acaulis*. *Stenotus acaulis* itself includes numerous formally named variants (Morse 2006). The genus *Stenotus* — including three species, *S. acaulis*, *S. armerioides*, and *S. pulvinatus*, excluding *Nestotus* [Stenotus] lanuginosus — is a morphologically and geographically coherent group.


![Figure 14](image-url) Generalized distribution of *Stenotus* species.
Nesom: *Stenotus* and *Nestotus*

Figure 16. *Stenotus armerioides*. Above, photo by Al Schneider, 4 May 2005, Utah. Below: Representative plants with details of involucres.
Figure 17. *Stenotus armerioides* involucres. Above, photo by Glen Lee, Saskatchewan. Below: photo by Al Schneider, 4 May 2005, Utah.
Figure 18. *Stenotus pulvinatus*. Above, photo by Jon Rebman, 12 Jun 2016, Sierra San Pedro Mártir. Below: Representative plant with short peduncle.
LITERATURE CITED


