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SCIENTIFIC NOTE

New distributional records and natural history notes for *Micropsephodes lundgreni* Leschen and Carlton (Coleoptera: Endomychidae)

Little is known about the distribution and biology of the recently described and rarely encountered eastern North American endomychid *Micropsephodes lundgreni* Leschen and Carlton. Although the diet remains unknown for adults and larvae of this species, *M. lundgreni* is presumably a mycophagous spore specialist like other anamorphines for which the diets are known. A number of recent survey projects, discussed below, provide some insights about the distribution and life history of this mysterious endemic inhabitant of southeastern U. S. forests.

New collection records are grouped by study and survey number for subsequent reference in the text. Label data and accompanying notes (in brackets) are as follows: **Study 1**. Survey 1 – USA: GA: Clarke Co., Whitehall Forest; 33°53′16.54″N, 83°21′34.54″W; 5–30.XI.2004, Lindgren funnel traps; coll. N. Lord, L. Shapiro, C. Rodriguez [8 specimens total: turpentine (5), frontalin (1), unbaited controls (2); mixed deciduous-pine forest]. Survey 2 – USA: GA: Greene Co.; Oconee Nat'l Forest; 33°40.700′ N, 83°16.921′ W; funnel trap; 12.IX–5.X.2005, coll. N. Lord, L. Shapiro, C. Rodriguez [13 specimens total: turpentine (3), verbenone (2), frontalin (1), unbaited controls (7); successional oak-hickory-pine forest]. Survey 3 – USA: GA: Greene Co.; Oconee Nat'l Forest; 33°40.700′ N, 83°16.921′ W; funnel trap; 10–24.IV.2006, coll. N. Lord [5 specimens total: frontalin (5); successional oak-hickory-pine forest]. **Study 2**. USA, GA, Oglethorpe Co.; Oconee National Forest; Scull Shoals Experimental Forest [33°46.118′ N, 83°16.689′ W]; Bottomland Hardwood Forest; ex: Flight intercept trap; Coll: MD Ulyshen [13 specimens total]. **Study 3**. Survey 1 – USA, SC, Barnwell Co.; Savannah River Site [33°19.987′ N, 81°31.216 W]; Upland Pine Forest; ex: Flight intercept trap; Coll: MD Ulyshen [1 specimen total]. Survey 2 – USA, SC, Barnwell Co.; Savannah River Site [33°8.641′ N, 81°40.162′ W]; Bottomland Hardwood Forest; ex: Flight intercept trap; Coll: MD Ulyshen [9 specimens total]. **Study 4**. USA, SC, Barnwell Co.; Savannah River Site [33°8.641′ N, 81°40.162′ W]; bmland hardwood for.; May 8 07, emerged from dead (~1 yr) sweetgum; Coll: MD Ulyshen [20 specimens total].

In Study 1, three surveys were conducted using Lindgren funnel traps to test the relative attraction of the monoterpene turpentine and the bark beetle pheromones frontalin (aggregation) and verbenone (anti-aggregation) to non-target cucujoid beetles at various inter-trap distances. In Survey 1, traps were set 5 m apart and showed no differences in level of attraction to *M. lundgreni* between traps. In Survey 2, the inter-trap distance was increased to 10 m and again no differences were detected between traps. In Survey 3, the inter-trap distance was increased to 50 m. Interestingly, the five specimens collected were all found in the trap baited with frontalin suggesting that specimens of *M. lundgreni* may be attracted to frontalin but are unable to accurately differentiate between baits at shorter inter-trap distances (5 and 10 m).

Terpenes produced in response to bark beetle injury and pheromones produced by the beetles themselves serve as attractants to bark beetle predators, parasitoids and inquilines (McCravy *et al.* 2000; Lindgren and Miller 2002; Pajares *et al.* 2004). Studies focused on the attraction of these compounds to bark beetles and their natural enemies often result in the collection of substantial numbers of non-target beetles from the superfamilies Cucujoidea and Cleroidea (M. Dalusky pers. comm.). Possibly, these compounds attract fungus-feeding taxa interested in the fungi introduced by the adult bark beetles for feeding their larvae (Paine *et al.* 1997) or for early detection of colonization of dead and dying trees by saprophagous fungi as a result of mass attack by bark beetles. However, the beetles may be simply orienting to the black funnels based on visual cues (*i.e.*, vertical silhouettes). Sampling in Louisiana using sectioned logs to recreate the vertical silhouettes of standing dead tree snags recovered 28 specimens of *M. lundgreni* (S.A. Gil, pers. comm.). While Study 1 suggests some level of attraction exists, it remains unclear whether the beetles are drawn to the chemical cues of the baits, the visual cues provided by the vertically-structured traps, or a combination.

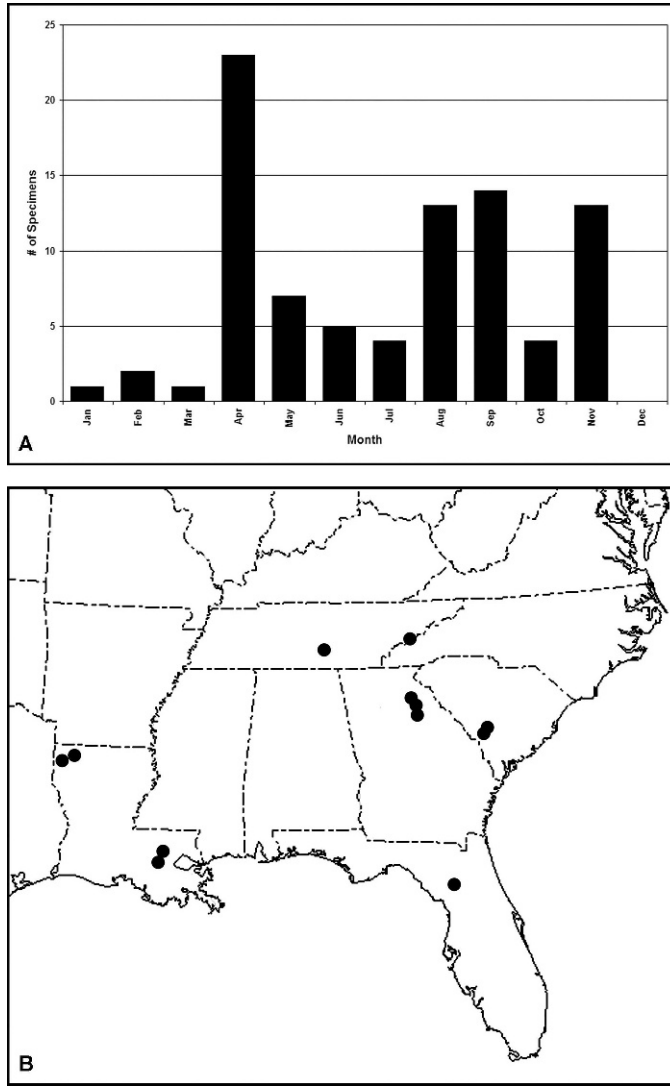

Fig. 1. Phenology (A) and distribution (B) of *M. lundgreni* based on all available published and unpublished collection records (n = 87).

A recent survey (Study 2) using 16 pairs of flight intercept traps to compare beetle diversity near the ground and in the canopy produced 13 specimens of *M. lundgreni*, all from traps suspended ≥ 15 m above the ground. Two similar surveys (Study 3) were conducted using flight intercept traps suspended at three heights (1, 6 and 11 m) next to three tree species (loblolly pine [*Pinus taeda* L.], water oak [*Quercus nigra* L.] and sweetgum [*Liquidambar styraciflua* L.]) in two different forest types. Traps were also placed 0.5 m above the ground along the lengths (1, 6 and 11 m) of felled logs of each species. Of the ten specimens collected, only one came from the upland site and nearly all (9/10) were captured

in traps suspended 6 or 11 m above the ground. An emergence study (Study 4) yielded 19 specimens of *M. lundgreni* from ~11 month-old sweetgum snags, and an additional specimen emerged from a sweetgum log of the same age. However, the species is not restricted to sweetgum. It has also been recovered from Southern Red Oak (*Quercus falcata* Michx.) in Louisiana and decaying wood of various species in Great Smoky Mountains National Park (S. Gil and M. Ferro, respectively, pers. comm.). *Micropsephodes lundgreni* adults may be active in the canopy, as suggested by Ulyshen and Hanula (2007), but Study 1, Leschen and Carlton (2000) and the unpublished studies mentioned above suggest that they are also active close to the ground.

Based on all the combined data available, *M. lundgreni* appears to be active throughout much of the year, with periods of increased activity in late spring and again in early fall (Fig. 1A). Thus far, the only month of the year that *M. lundgreni* has not been recovered is December. Taking into account the new state records presented here for Georgia and South Carolina and previous records from Florida, Louisiana and Tennessee, *M. lundgreni* appears to be widespread throughout the southeastern United States (Fig. 1B), as anticipated by Leschen and Carlton (2000). These observations, while interesting, are still based on a relatively small number of specimens. Nonetheless, they offer some useful insights into the biology of *M. lundgreni*.

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