

Outlineoffungi.org - Note 732 *Neohyperdermium*

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Neohyperdermium Thanakitp. & Luangsa-ard

Neohyperdermium was introduced by Thanakitpipattana et al. (2022) to accommodate two combinations: *Neohyperdermium piperis* (J.F. Bisch. & J.F. White) Thanakitp. & Luangsa-ard (type species) and *Neohyperdermium pulvinatum* (J.F. White, R.F. Sullivan, Bills & Hywel-Jones) Thanakitp. & Luangsa-ard. Both the species are epibiotic on remnants of scale insects attached to branches of *Asteraceae* and *Piper carrilloanum* (*Piperaceae*), producing stromata larger than that of their scale insect hosts (Sullivan et al. 2000, Bischoff & White Jr 2004). The disparity in fungal stroma size to scale insects also can be seen in other clavicipitalean genera, such as *Dussiella* (Torres & White 2009) and *Ascopolyporus* (Thanakitpipattana et al. 2022). Previous mycologists proposed that these fungi first consume their hosts by acting as a parasite and then continue to absorb the nutrition from associated plant host through the insect's remaining stylet (Bischoff & White Jr 2004, Thanakitpipattana et al. 2022). By having *Lecanicillium* anamorphs with close affinity with *Lecanicillium lecanii* based on phylogenetic analysis of the LSU gene, Bischoff & White Jr (2004) initially identified *N. piperis* as *Torrubiella piperis*. Later, the phylogenetic analysis of combined nrSSU-nrLSU-*tef1-rpb1-rpb2* sequence shown that *Torrubiella piperis* was restricted to the *Cordyceps sensu stricto* clade which contains *Cordyceps confragosa*, a species with sexual morph and asexual morph similar to the former species (Johnson et al. 2009). The authors thus transferred *Torrubiella piperis* to *Cordyceps* (Johnson et al. 2009). Although the phylogenetic analysis of LSU sequence shown *Neohyperdermium pulvinatum* was closely related to *Cordyceps militaris*, Sullivan et al. (2000) assigned the former species to *Hyperdermium* in view of its multi-septate conidia.

Neohyperdermium is characterized by sessile, white to yellow, flattened to pulvinate stroma, immersed, obpyriform, cymbiform to cone-shaped perithecia, filiform asci with thickened cap, hyaline, filiform, multiseptate, ascospores which disarticulating into part-spore or not (Sullivan et al. 2000, Bischoff & White Jr 2004). Conidiophores are verticillate, erect, form on the surface of stroma, with cylindrical, septate, slightly attenuated toward the apex, phialides and hyaline, fusiform, subcylindrical, aseptate to multiseptated conidia aggregated in globose head on the tip of phialides (Sullivan et al. 2000, Bischoff & White Jr 2004). The sexual morph of *Neohyperdermium* shares similarity with other clavicipitalean scale insect pathogenic genera, such as *Hypocrella*, *Moelleriella*, and *Samuelsia* (Chaverri et al. 2008). These three clavicipitalean genera typically produce Aschersonia-like asexual morphs, while it is *Lecanicillium*-like in *Neohyperdermium*. Additionally, the multigene phylogeny based on concatenated LSU-*tef1-rpb1-rpb2* sequences also shown that species of *Neohyperdermium* clustered into a separated lineage within *Cordycipitaceae* and was distantly related to *Hypocrella*, *Moelleriella*, and *Samuelsia* (Thanakitpipattana et al. 2022). Therefore, *Neohyperdermium* was established to harbor species with

Hypocrella-like sexual morphs and *Lecanicillium*-like asexual morphs.

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