Comments on *Cognettia* Nielsen & Christensen, 1959 (Annelida, Oligochaeta, ENCHYTRAEIDAE): proposed precedence over *Euenchytraeus* Bretscher, 1906 and *Chamaedrilus* Friend, 1913
(Case 3689; see BZN **72**: 186–192)

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As we were responsible for re-establishing *Euenchytraeus* Bretscher, 1906 and *Chamaedrilus* Friend, 1913, suggesting that *Cognettia* Nielsen & Christensen, 1959 should be treated as a junior synonym of *Chamaedrilus* (Martinsson et al., 2014; cited as 2015a by Schmelz et al.), we would like to give some supplementary information on the case, and also explain the reasoning behind the reestablishments. In their appeal to the Commission, Schmelz et al. (BZN **72**: 186–192) give a good repetition of the taxonomical history of the taxa involved (detailed by us in Rota et al., 2008; Martinsson et al., 2014, 2015). However, we would like to highlight a few additional points.

1. The case in question (our invalidation of *Cognettia* in favour of *Chamaedrilus* and *Euenchytraeus*) arose after two of us (Martinsson & Erséus, 2014) provided molecular evidence that *Cognettia sphagnetorum* (Vejdovský, 1878) in its commonly accepted definition, based on Nielsen & Christensen's (1959) revisionary work, is a non-monophyletic complex of species. Given the relevance of these worms in soil ecological studies, this resulted in an urgent need of taxonomic revision within *Cognettia*, a revision that we carried out (Martinsson et al., 2014) using genetic and morphological data.

2. Before our revision (Martinsson et al., 2014), *Pachydrilus sphagnetorum* Vejdovský, 1878, the nominal species designated by Nielsen & Christensen (1959) as type species of *Cognettia*, had no extant type material.

3. The type species of *Chamaedrilus*, *Ch. chlorophilus* Friend, 1913, is represented by two syntypes preserved in the Natural History Museum, London (NHM), slide BMNH 1949.3.1.32 (Martinsson et al., 2014). As documented by register records at NHM, this slide contains 'Friend's types of *Chamaedrilus chlorophilus*' (source: NHM (2014). Dataset: Collection specimens. Resource: Specimens, http://dx.doi.org/10.5519/0002965, Retrieved: October 2015). We borrowed this slide for our

re-investigation of *Ch. chlorophilus* (Martinsson et al., 2014 and designated the mature syntype as lectotype).

4. When Nielsen & Christensen (1959) redescribed the type species of *Cognettia*, they mentioned the frequent occurrence of a 'single sub-median supernumerary bulb' in front of the penial bulbs. In revising the *C. sphagnetorum* species complex, we found this feature to occur only in combination with the chaetal arrangement (2 chaetae in preclitellar lateral bundles and 3 chaetae in other bundles) that is specific for *Ch. chlorophilus* (Martinsson et al., 2014). Thus, Nielsen & Christensen (1959) had – intentionally or not – treated *C. sphagnetorum* and *Ch. chlorophilus* as one and the same species. We do not know whether Nielsen & Christensen (1959) missed that *Ch. chlorophilus* had been synonymised with *C. sphagnetorum* by Černosvitov (1937a) (subjective junior synonymy) – which would be noteworthy, as they discussed Friend's taxa in their introduction. In any case, Nielsen & Christensen (1959) established *Cognettia* on the same type species as that of *Chamaedrilus* and this indeed makes *Cognettia* as a genus an invalid name (objective junior synonymy). It is as if Nielsen & Christensen (1959) had replaced *Chamaedrilus* by an unjustified emendation and without proposing *Cognettia* expressly as a new replacement name (nomen novum). *Chamaedrilus* was still an available name, its replacement not being required by any provision of the Code.

5. According to Schmelz et al. (2015), the main reason for giving precedence to *Cognettia* over *Chamaedrilus* would be the prevention of nomenclatural confusion in view of the importance of *Cognettia* species, and particularly of *C. sphagnetorum,* in soil ecological research. The problem is, however, that neither *C. sphagnetorum* nor *C. glandulosa* (Michaelsen, 1888b), the two most 'popular' enchytraeid names in soil ecology literature, each correspond to single species when identified, as has been done for decades, using Nielsen & Christensen's (1959) diagnoses – or even worse, if identified according to the broadened definitions recently proposed by Schmelz & Collado (2010, 2012a). It is still the opinion of several ecologists that the ENCHYTRAEIDAE or at least their genera respond homogeneously to environmental drivers. However, community analyses conducted at the species level (e.g. Rota et al., 2013) show clearly that within enchytraeid genera there can be a variety of ecological tendencies. Nielsen & Christensen's (1959) diagnosis of *C. sphagnetorum* identified a non-monophyletic set of species (Martinsson & Erséus, 2014) that has now been formally resolved into four separate *Chamaedrilus* species with distinct ecology (Martinsson et al., 2014). *Cognettia glandulosa*, as well, in its long-accepted definition included two well-separate genetic lineages (Martinsson & Erséus, 2014); these too have been recently formalized as two distinct *Chamaedrilus* taxa, morphologically very similar (differing mainly in size) but preferring different habitats (Martinsson et al., 2015). Unfortunately, when reading through the ecological literature on *Cognettia*, one cannot tell which single taxonomic unit was the object of each ecological study, or where and when a mixture of species was involved.

For the reasons stated above, neither the bulk of ecological studies nor the recent soil biology textbooks will be unburdened from serious ambiguities if the name *Cognettia* is preserved, because data are referred monospecifically to species assemblages with heterogeneous ecology. It is our hopeful conviction, instead, that a new nomenclature combined with a better taxonomic resolution at species level will serve

to prompt a fresh start in the ecological characterization of the individual taxonomic units in the '*Cognettia*' world.

6. Taxonomic clarity, geographic distribution and ecological range of genera and species are all aspects still in a state of uncertainty for many components of the ENCHYTRAEIDAE (Rota & de Jong, 2015) and all efforts should be focused to improve quality in genera and species circumscriptions, for instance as fundamental prerequisites for biodiversity assessment in any geographical region. The nomenclatural distinction of *Euenchytraeus* Bretscher, 1906 from *Chamaedrilus* aims at this same purpose, as we already have evidence that the two taxa are phylogenetically separate.

7. When we started our revision (Martinsson et al., 2014) and considered that *Chamaedrilus* and *Euenchytraeus* should replace the widely used *Cognettia*, we were at first concerned that changes in customary usage might create instability, and reflected on submitting to the Commission a case similar to the one here discussed. However, personal experience from one of us (Erséus et al., 2005; ICZN, 2007) made us hesitate, as it is a fairly long process with an uncertain outcome. On the other hand, the synonymy between *Cognettia*, *Chamaedrilus* and *Euenchytraeus* was pointed out earlier by Schmelz & Collado (2010, p. 82) themselves, with the remark: ''To conserve *Cognettia* as valid name a proposal towards the ICZN is necessary'', but such a proposal (that we would have welcomed, if it had been submitted to the Commission earlier) never appeared in the next few years. Therefore, having underway our phylogenetic revision of these taxa, we decided to simply follow the code: re-establish *Chamaedrilus* as a senior synonym of *Cognettia* and resuscitate *Euenchytraeus* as a valid genus (Martinsson et al., 2014).

8. The taxonomy of ENCHYTRAEIDAE has for a long time been under soft rules and some of the family's early nomenclature is in continuous revision and evolution. It is true, as Schmelz et al. (2015) state, that 'the nomenclatural and taxonomic framework established in Nielsen & Christensen (1959) was widely accepted by taxonomists and non-taxonomists' and that 'their 1959 monograph, followed by two supplements (Nielsen & Christensen, 1961, 1963) launched a new era of research with enchytraeids, particularly in the field of soil ecology'. However, Nielsen & Christensen (1959, 1961, 1963), as often noted (e.g. Brinkhurst, 1971; Schmelz, 2003) and by their own admission (1959, p. 10), did not always comply with the rules of the Code, as they 'decided not to embark upon an unpromising formal revision of all original descriptions and type material that might be extant in various collections'. Thus, in spite of their huge effort and merits, their critical revision of ENCHYTRAEIDAE left the nomenclature of many taxa subject to debate and the genus-level and species-level taxonomy in many cases problematic and typological. By recognizing and delimiting monophyletic groups based on common descent, phylogenetic methods are gradually alleviating some of the classification problems – as are molecular analyses effective in helping detecting and separating cryptic species. With regard to nomenclature, Rota & de Jong (2015) have listed the novelties (new nomina and nomenclatural acts) occurred just in the last 10 years among the enchytraeid species and genera living in Europe: 39 new species, 11 new combinations, 8 reinstatements as valid names, 4 rejected synonymies.

9. The name change from *Cognettia* to *Chamaedrilus* has already started to be accepted by both ecologists and taxonomists and, since the time of our revision (Martinsson et al., 2014), several publications have treated *Chamaedrilus* as a valid

name (Boros & Dózsa-Farkas, 2015; Dózsa-Farkas et al., 2015; Holmstrup et al., 2015; Martinsson et al., 2015; Rota & de Jong, 2015; Schmelz & Collado, 2015; Torii, 2015), indicating that the name change from *Cognettia* to *Chamaedrilus* may not create the feared instability predicted by Schmelz et al. (2015). Furthermore, two species, *Chamaedrilus varisetosus* Martinsson, Rota & Erséus, 2015 and *Chamaedrilus ozensis* Torii, 2015, have been described after our revision. There is a risk that it would be even more confusing and create more instability if the name for this genus is to change back to *Cognettia* from *Chamaedrilus*.

In fact, more confusion in zoological nomenclature may originate from, and be sustained by, inconsistent, contradictory communications: for instance, Schmelz & Collado (2015) in updating the list of valid taxa of ENCHYTRAEIDAE, accepted the new *Chamaedrilus* and *Euenchytraeus* synonymies, but then, shortly afterwards, the same authors proposed rejection in favour of the old *Cognettia* names (Schmelz et al., 2015). Similarly, at the species level, those same authors (Schmelz & Collado, 2010, p. 79; 2012a, p. 56; 2012b, p. 70) first lumped a number of morphologically distinct species under the name '*C. sphagnetorum* sensu lato', but then reconsidered their act by publishing again those species as revalidated and assigned to *Chamaedrilus*.

10. In sum, the progress in the knowledge of the family ENCHYTRAEIDAE can be furthered only by a continually refined taxonomy and by nomenclature following the system: stability must not have priority over lack of ambiguity. We are well aware of the multidisciplinary relevance of zoological names, and it is precisely for this reason that names should be assigned correctly and univocally, and be used consistently by taxonomists, ecologists and experimental scientists as means for scientific communication. Through our proposed new nomenclature, and improved taxonomic resolution, we will gain a much better understanding of several '*Cognettia*' taxa that were thus far confounded in soil research.

11. The points above lead us to the conclusion that *Euenchytraeus* Bretscher, 1906 and *Chamaedrilus* Friend, 1913 ought to be kept as valid names, and that there are no contraindications for treating *Cognettia* Nielsen & Christensen, 1959 as a junior synonym of *Chamaedrilus*.

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