ENGLISH NATURE

Research information note

English Nature Research Report 625

Synonymy between *Battarraea phalloides* and *B. Stevenii*

Report Authors: Peter Jeffries and Lynton McLain, August 2004

Keywords: *Battaraea, phalloides, stevenii,* sandy stiltball, sand stilt puffball

Introduction

Battarrea phalloides, the sandy stilt puffball, is one of four non-lichenised fungi afforded legal protection by being included in Schedule 8 of the Wildlife and Countryside Act 1981. *Battarrea phalloides* is classified as endangered in the GB provisional Red Data List and is subject to a Priority Species Action Plan, under United Kingdom Biodiversity Action Plan. *Battarrea phalloides* and *B. stevenii* are morphologically similar, and limited molecular data has recently suggested they could be considered as synonyms. This study aimed to resolve the question of conspecificity.

What was done

This study used traditional and molecular methods to compare field-collected English specimens and an extensive range of herbarium material in order to resolve the question of conspecificity. Tissue from 78 specimens of *B. phalloides* and *B. stevenii* were obtained from the Herbarium of the Royal Botanic Gardens, Kew. These comprised the entire Kew collection of these species, one of the largest in the world. *Battarrea phalloides* specimens came largely from the UK, in similar habitats, whereas *B. stevenii* specimens came from a variety of world sites, with widely differing habitats. Other fresh samples were collected in Suffolk, from the area where the first specimen of *B. phalloides* was found in 1782.

Variability between specimens was assessed by comparing basidiocarp morphology and spore sizes. Molecular studies were based on SSCP (single-strand conformation polymorphism) analysis and sequence comparison of the internal transcribed spacer (ITS) regions of the rRNA gene cluster of the fungal genome.

continued >>>

Results and conclusions

Morphological comparisons showed that the specimens examined formed a continuum, but that specimens would be assigned species identities on the basis on size or other variable characters. For example, there was a wide range of stipe and cap sizes between specimens of *B. stevenii* from a range of world habitats, while specimens labelled *B. phalloides* were generally more consistent in size and smaller than those of *B. stevenii*. Spore sizes also showed a continuum across the two species rather than a bi-modal distribution.

SSCP analysis showed that there was variability in sequence within the ITS region, but this did not correlate with the species designation. Phylogenetic analysis of ITS sequence data did not separate *B. phalloides* and *B. stevenii* specimens, thus suggesting they are conspecific.

In conclusion, we found little evidence to separate the two species. Specimens labelled *B. stevenii* came from a diversity of habitats, some of which might have influenced their morphology. Thus taller, scalier specimens would be assigned to *B. stevenii*, on the basis of environmentally-influenced morphology, even though the molecular evidence suggests they are conspecific with *B. phalloides*.

English Nature's viewpoint

This research provides strong evidence that *B. phalloides* and *B. stevenii* are conspecific. This information may influence the conservation status of this species especially when considering its status in a European or international context.

Key References

PEGLER, D.N., LAESSOE, T., & SPOONER, B.M. 1995. *British puffballs, Earthstars and stinkhorns, an account of the British gasteroid fungi.* Kew: Royal Botanic Gardens.

Further information

For the full report or other publications on this subject, please contact the Enquiry Service on 01733 455100/101/102 or email enquiries@english-nature.org.uk

For further information about the work of English Nature, please visit our website at: www.english-nature.org.uk