
BASIDIOPHORA ENTOSPORA IN AUSTRALIA

James H. Cunnington¹ & Ovidiu Constantinescu²

¹ Department of Primary Industries, Knoxfield Centre, Private Bag 15, Ferntree Gully Delivery Centre, Victoria 3156, Australia.

² Botany Section, Museum of Evolution, Evolutionary Biology Centre, Uppsala University, Norbyvägen 16, SE-752 36 Uppsala, Sweden.

Abstract

During an examination of *Peronospora* specimens in herbarium VPRI, a single collection of *Basidiophora entospora* was discovered. This fungus has not been recorded previously in Australia. The specimen was collected in 1906 on leaves of ?*Conyza* sp. (Asteraceae).

J.H. Cunnington & O. Constantinescu (2006). *Basidiophora entospora* in Australia. *Australasian Mycologist* 25 (2): 58–60.

Introduction

Basidiophora is a monotypic genus in the Peronosporales (Chromista). Several species have been placed in this genus, but Constantinescu (1998) revised the group and reduced them to synonymy with *B. entospora* Roze & Cornu. *Basidiophora entospora* is an obligate plant pathogen, largely restricted in host range to the tribe Astereae in the Asteraceae. Common hosts include *Aster novae-angliae*, *Conyza bonariensis*, *C. canadensis*, *Mikania micrantha*, *Solidago rigida* and *S. gigantea*. The fungus is common in Europe and North America, and has also been recorded in New Zealand, Iraq, Japan and South America (Baretto and Dick 1991, Constantinescu 1998, Francis 1981). Additional records of occurrence include China (Tai 1979), Jordan (Abu-Blan and Khlaif 1994), Russia (Jaczewski 1901), and Uzbekistan (Panfilova and Gaponenko 1963).

During an examination of *Peronospora* specimens in herbarium VPRI, a single collection of *B. entospora* was found. This fungus has not been previously recorded in Australia. The specimen, collected in 1906, was probably overlooked during previous documentation of plant pathogenic fungi in Victoria as the specimen was simply labelled as '*Peronospora*-like on undetermined host'.

Materials and Methods

Material was mounted in 60% or 100% lactic acid, heated until boiling and examined using interference contrast.

Specimen examined: *Basidiophora entospora*, on leaves of ?*Conyza* sp. (Asteraceae), Bunyip, Vic., G.H. Robinson, Oct. 1906, **VPRI** 190.

Results and Discussion

Although the specimen consisted of several dozen leaves, sporulating structures were found on only three leaves. Most leaves had the typical symptoms of infection by *B. entospora*, that is, slightly discoloured blotches on the upper surface of the leaves. These lesions were hardly visible owing to the age of the specimen. The fading of these symptoms in herbarium specimens is typical for *B. entospora* (Constantinescu 1998). Despite the small amount of fungal material present, the fungus was in reasonably good condition.

Sporangiophores were emerging from stomata on the underside of the leaf. They had distinctive swollen apices from which arose up to about 20 projections (Fig. 1A.). Sporangia (Fig. 1B.) were ovoid, with an apical dehiscence apparatus and a basal pedicel.

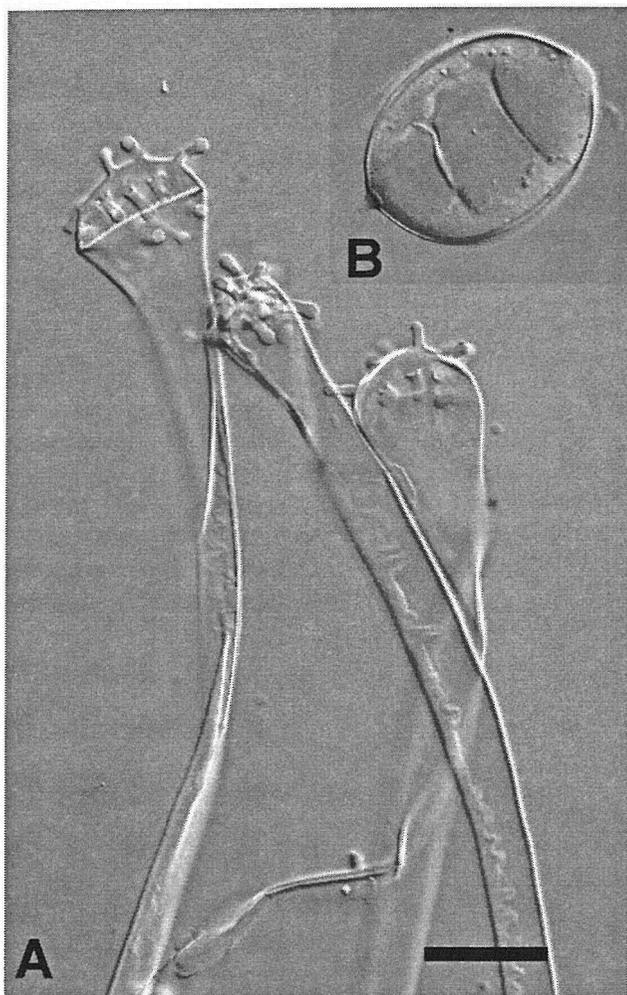


Figure 1. *Basidiophora entospora* (VPRI 190). A. Sporangiohores. B. Sporangium. Scale bar equals 30 µm.

The sporangia varied in length from 30 to 60 µm. They were considerably larger than those typical of *B. entospora* (c. 23–33 µm) but such variation is documented in this species. Constantinescu (1998) noted that some specimens had sporangia up to 50 µm long. This was attributed to high humidity during the time of collection, or to the specimens not being properly processed. The way in which the sporangia collapse after drying can also lead to unusually high measurements (Constantinescu 1998). Resting organs were not seen.

It was difficult to identify the host plant as floral parts were absent from the specimen. First attempts to identify the host failed, but when the common hosts of *B. entospora* were taken into consideration, the material was tentatively identified as a species of *Conyza* (J.

Reid, personal communication). *Basidiophora entospora* was first recorded in New Zealand in 1959 on *Felicia bergeriana* (Jafar 1959). Since then, most specimens collected in New Zealand (and deposited in PDD) have been on *Erigeron floribundus* (<http://nzfungi.landcareresearch.co.nz/html/mycology.asp>). The most recent Flora of New Zealand notes that authors in New Zealand have used the name *E. floribundus* in the past, for the taxon now considered to be *C. albida* (Webb *et al.* 1998). This agrees with the re-identification of the host of the Australian specimen.

Cunnington and Mann (2004) discussed the occurrence of *Taphrina bullata* on pear in Australia in the early 1900s. Like *B. entospora*, it has not been collected in Australia since that time. Both fungi are plant pathogens and their hosts are common and widespread in Victoria and Australia. Perhaps these collections were made soon after the introduction of these species into Australia, and their small populations did not survive. Given that *B. entospora* has been collected numerous times in New Zealand, it seems unlikely that climatic conditions in southeastern Australia led to its demise. Or, they might just be weakly pathogenic fungi that do not thrive in Australia, and which escape the notice of plant pathologists and mycologists. Other factors that may explain the rare reports of this fungus are the imperceptible symptoms produced on the host and the fact that it primarily attacks the basal leaves that are first to wilt in dry conditions or because of aging. Nevertheless, this fungus does not seem to thrive in arid and/or warm climates as it was not recorded from several such territories for which detailed lists of plant parasites exist: India (Bilgrami *et al.* 1979), Iran (Ershad 1995), Pakistan (Ahmad *et al.* 1997), Morocco (Rieuf 1969), Libya (El-Buni and Rattan 1981), and South Africa (Crous *et al.* 2000).

Acknowledgements

We thank John Reid (MEL) for identifying the host plant and Sharon Morley (VPRI) for her technical assistance.

References

- Abu-Blan, H. and Khlaif, H. (1994). The genera of Peronosporaceae in Jordan. *Dirasat, Pure & Applied Sciences* **21B**, 52–61.
- Ahmad, S., Iqbal, S.H. and Khalid, A.N. (1997). *Fungi of Pakistan*. University of Punjab, Lahore.
- Barreto, R.W. and Dick, M.W. (1991). Monograph of *Basidiophora* (Oomycetes) with the description of a new species. *Botanical Journal of the Linnean Society, London* **107**, 313–332.
- Bilgrami, K.S., Jamaluddin, S. and Rizwi, M.A. (eds) (1991). *Fungi of India. List and references*. 2nd Edition. Today & Tomorrow, New Delhi.
- Constantinescu, O. (1998). A revision of *Basidiophora* (Chromista, Peronosporales). *Nova Hedwigia* **66**, 251–265.
- Crous, P.W., Phillips, A.J.L. and Baxter, A.P. (2000). *Phytopathogenic Fungi from South Africa*. University of Stellenbosch, Stellenbosch.
- Cunnington J.H. and Mann, R.C. (2004). The disappearance of *Taphrina bullata* from Australia. *Australasian Plant Pathology* **33**, 241–247.
- El-Buni, A.M. and Rattan, S.S. (1981). *Check List of Libyan Fungi*. Al Faateh University, Tripoli.
- Ershad, D. (1995). *Fungi of Iran*. 2nd edition. Agricultural Research, Education and Extension Organization, Teheran.
- Francis, S.M. (1981). *Basidiophora entospora*. *CMI Descriptions of Pathogenic Fungi and Bacteria* **681**, 1–2.
- Jaczewski, A.A. (1901) *Mycological Flora of European and Asiatic Russia. Vol. 1. Peronosporales*. Moskva. [In Russian.]
- Jafar, H. (1959). Discovery of the genus *Basidiophora* Rose et Cornu in New Zealand. *New Zealand Journal of Agricultural Research* **2**, 249–251.
- Panfilova, T.S. and Gaponenko, N.I. (1963). *Mycoflora of the river Angren basin*. Tashkent. [In Russian.]
- Rieuf, P. (1969). Parasites et saprophytes des plantes au Maroc. *Cahiers de la Recherche Agronomique* **27**, 1–178.
- Tai, F.L. (1979). *Sylloge fungorum sinicorum*. Science Press, Peking. [In Chinese.]
- Webb, C.J., Sykes, W.R. and Garnock-Jones, P.J. (1988). *Flora of New Zealand 4. Naturalised Pteridophytes, Gymnosperms, Dicotyledons*. Botany Division, Department of Scientific and Industrial Research.