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TWO NEW GENERA OF THE EUROTIALES

J. A. VON ARX & R. A. SAMSON

Centraalbureau voor Schimmelcultures, Baarn

(With Plate 39 and one Text-figure)

The ascomycete *Anixiopsis peruviana* Cain is transferred to a new genus *Xanthothecium* v. Arx & Samson. The name *Leucothecium emdenii* v. Arx & Samson, gen. nov., spec. nov. is proposed for a soil-borne fungus with light coloured, smooth cleistothecia, catenulate asci, lenticular ascospores and an arthroconidial state. The relationships of both genera are discussed.

Recently two cleistothecial ascomycetes were isolated from agricultural soil at Wageningen by J. H. van Emden and Mrs J. W. Veenbaas-Rijks. One of them could be identified as *Anixiopsis peruviana* Cain=*Arachnomyces peruvianus* (Cain) Malloch & Cain. Since the classification in these two genera is unsatisfactory the new genus name *Xanthothecium* is proposed for this fungus. The second species appeared to differ sufficiently from all known members of the Eurotiales to be described as a new species of the new genus *Leucothecium.*

Xanthothecium v. Arx & Samson, *gen. nov.*

Coloniae restrictae, aetate lanosae vel tomentosae; ascomatum initialia duabus hyphis contortis formata; ascomata sphaerica, non-ostiolata, superficialia vel submersa in mycelio aerio, brunneola, levia, pariete crasso e nonnullis stratis hypharum crassi-tunicatarum, modice complanatarum vel isodiametricarum, rubrobrunnearum composito; asci acervati, non catenulati, late clavati vel obovati, 8-spori, evanescentes; ascosporae parvae, oblatae, continuae, minute echinulatae, subluteae; status conidialis ignotus. Species non keratinophila. — Species typica: *Anixiopsis peruviana* Cain.

Colonies restricted, becoming lanose or tomentose, initials consisting of 2 coiled hyphae; ascomata spherical, non ostiolate, superficial or immersed in the aerial hyphae, brownish, with a smooth wall, composed of several layers of thick-walled, slightly flattened or isodiametrical, reddish brown cells; asci in clusters, not catenulate, broadly clavate or obovate, 8-spored, evanescent; ascospores small, oblate, 1-celled, finely echinulate, yellowish; conidial state unknown; not keratinophilic.

TYPE SPECIES.—*Anixiopsis peruviana* Cain *in* Can. J. Bot. **35**: 261. 1957 (basionym). — *Arachnomyces peruvianus* (Cain) Malloch & Cain *in* Can. J. Bot. **48**: 841. 1970. — **Xanthothecium peruvianum** (Cain) v. Arx & Samson, *comb. nov.*

Cultures examined:

CBS 112.54= type culture of *A. peruviana*, isolated by P. van der Laan from cysts of *Heterodera rostochiensis* Wollenw., collected in Sierra Central Peruana, Huancayo, Peru.

CBS 563.66= IMI 113,733, isolated by G. L. Barron from peat soil, Guelph, Ontario, Canada.

CBS 301.67, isolated by R. Franquet from salty soil, Nancy, France.
CBS 713.73, isolated as strain 120147 from agricultural soil at Wageningen by Mrs J. W. Veenbaas-Rijks.

Xanthothecium peruvianum has been described in detail by Stolk (1955) as *Anixiopsis stercoraria* (Hansen) Hansen, by Cain (1957) as *Anixiopsis peruviana* and by Malloch & Cain (1970) as *Arachnomyces peruvianus*. The species was classified by Malloch & Cain (1970) in *Arachnomyces*, because when grown in pure culture, it closely resembles *A. minimus* Malloch & Cain, which is a typical species of *Arachnomyces*. However, *Xanthothecium peruvianum* differs from *A. minimus* and other species, described in *Arachnomyces* by its glabrous ascomata and by echinulate ascospores. In species of *Arachnomyces* the ascomata are provided with characteristic, long appendages and the ascospores are smooth.

Typical species of the genus *Anixiopsis* Hansen can be separated from *Xanthothecium* by broadly ellipsoidal, reticulate ascospores (de Vries, 1969). *Xanthothecium* is related to the genus *Keratinophyton* Randhava & Sandhu (1963–1964), which is characterized by large, thick-walled ascomata, oblate, smooth ascospores, a *Chrysosporium* (*Trichophyton*)-like conidial state and its keratinophilic properties. Another related genus is *Aphanoascus* Zukal with large, hemispherical, reddish ascomata, catenulate asci and ellipsoidal, ornamented ascospores (cf. Udagawa & Takada, 1973).

Leucothecium v. Arx & Samson, *gen. nov.*

Coloniae hyalinae; ascomatum initialia e glomo parvo intricatarum constant; ascomata sphaerica, non ostiolata, superficialia, fere hyalina, levia vel minute tomentosa, pariete persistente e nonnullis stratis cellularum hyalinarum complanatarum composito; asci irregulariter dispositi, catenulati, ellipsoidei vel subglobosi, 8-spori, evanescentes; ascosporae parvae, lenticulares, continuae, hyalinae, minute verrucosae, zona aequatoriali elevata praeditae. Arthroconidia cylindrica, continua, hyalina, e hyphis aeriis fragmentatione formantur. — Species typica: *Leucothecium emdenii* v. Arx & Samson, spec. nov.

Colonies light coloured; initials consist of a small clew of hyphae; ascomata spherical, non-ostiolate, superficial, light coloured, smooth, with a persistent wall, composed of several layers of flattened, hyaline cells; asci irregularly disposed, catenulate, ellipsoidal or nearly spherical, 8-spored, evanescent; ascospores small, lenticular, 1-celled, hyaline, finely verrucose, with an equatorial rim; arthroconidia 1-celled, cylindrical, hyaline, borne from superficial hyphae by fragmentation.
TYPE SPECIES.—*Leucothecium emdenii* v. Arx & Samson, spec. nov.

Leucothecium emdenii v. Arx & Samson, *spec. nov.*

Coloniae in agaro extracto faecis et amylo additis vel extracto malti admixto albidae vel subluteae, lanosae, 24 °C in diebus fere 2 mm crescunt; odor proteini putridi. Hyphae vegetativae hyalinae, ramosae, 1–2.2 μm crassae, tenui-tenicatae; ascomatum initialia e hyphis tenui-tunicatis, hyalinis, in glomo intricatis constant; ascomata sphaerica, non ostiolata, levia vel tomentosa in iuventute, hyalina vel sublutea, 130–400 μm diam., pariete persistente, 6–10 μm crasso, e 2–3 stratis hypharum complanatarum hyalinarum, 6–10 μm diam. constant; asci breviter catenulati, ellipsoidei vel subglobosi, 8-spori, evanescentes, 6–8 × 5–7 μm;

ascosporae lenticulares, hyalinae, verruculosae, zona aequatoriali praeditae, 2.5–3 × 1.7–2.3 μm; arthroconidia cylindrica, hyalina, continua, 3–9 × 1.5–2.3 μm. — Typus: CBS 576.63, isolatus e terra agresti, Wageningen, a J. H. van Emden.

ETYMOLOGY: The species is named after Ir. J. H. van Emden (Instituut voor Plantenziektekundig Onderzoek, Wageningen), who supplied the CBS for many years with interesting cultures, isolated from soil.

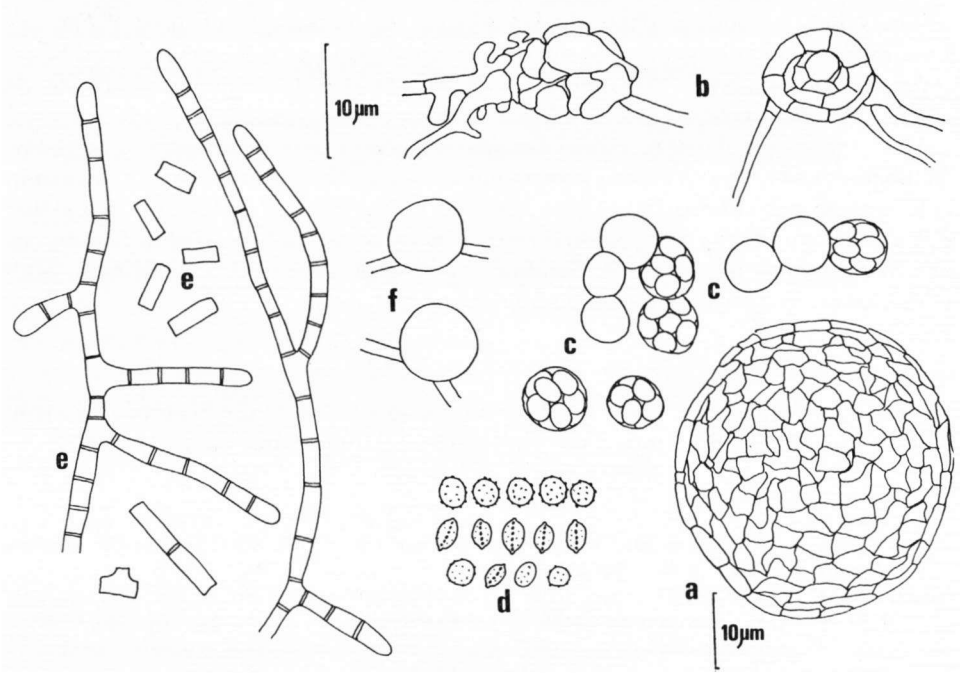

Fig. 1. *Leucothecium emdenii*. — a. Ascoma. — b. Initials. — c. Asci. — d. Ascospores. — e. Arthroconidial state. — f. Chlamydospore-like cells.

Colonies on YpSs or malt agar whitish or yellowish, lanose, with a daily growth rate at 24°C of about 2.2 mm, with a foul stench of rotten protein; hyphae hyaline, branched, forming dense wefts, remotely septate, 1–2.2 μm wide, thin-walled; initials consisting of thin-walled, hyaline hyphal cells coiled in a small clew, often surrounding a central cell; ascomata spherical, non-ostiolate, smooth or slightly tomentose when young, hyaline to yellowish, 130–400 μm in diameter, with a persistent wall, 6–10 μm thick, composed of 2 or 3 layers of flattened, hyaline, 6–10 μm wide cells; asci irregularly disposed, usually in short chains, ellipsoidal or nearly spherical, 8-spored, evanescent, 6–8 × 3–7 μm; ascospores lenticular, hyaline, yellowish in mass, finely verrucose, with an equatorial rim, 2.5–3 × 1.7–2.3 μm in size; arthroconidia borne on the aerial hyphae by fragmentation, cylindrical, hyaline, 1-celled, 3–9 × 1.5–2.3 μm; chlamydospore-like cells sometimes present, hyaline, spherical, 5.5–7 μm in diameter.

Optimal growth occurs between 20°–25°C; no growth at 30°C; minimum temperature about 10°C.

The genus *Leucothecium* is closely related to *Dichotomomyces* Saito ex Scott. Both genera agree in the structure of the ascomatal wall, asci and ascospores, but can be distinguished by different ascomatal initials and by different conidial states. In *Dichotomomyces* the initials are large and composed of coiling hyphae; the ascomata are tomentose and the conidia are borne in basipetal succession on dichotomously branched cells (form genus: *Polypaecilum*).

The yellow, smooth ascomata of *Leucothecium* are reminiscent of those of *Eurotium* Link ex Fr. The latter genus, however, is osmophilic and usually accompanied by an *Aspergillus* conidial state. Furthermore the ascomatal wall is composed of a single layer of flattened cells.

In its formation of arthroconidia *Leucothecium emdenii* resembles *Xynophila mephitalis* Malloch & Cain (1971). In this keratinophilic fungus the ascomata are embedded in a tomentose subiculum, the wall is reduced or in younger states absent and the oblate ascospores have no equatorial rim. Other genera closely related to *Leucothecium* are *Keratinophyton* Randhava & Sandhu and *Xanthothecium* v. Arx & Samson, both with darker, thick-walled ascomata and oblate ascospores.

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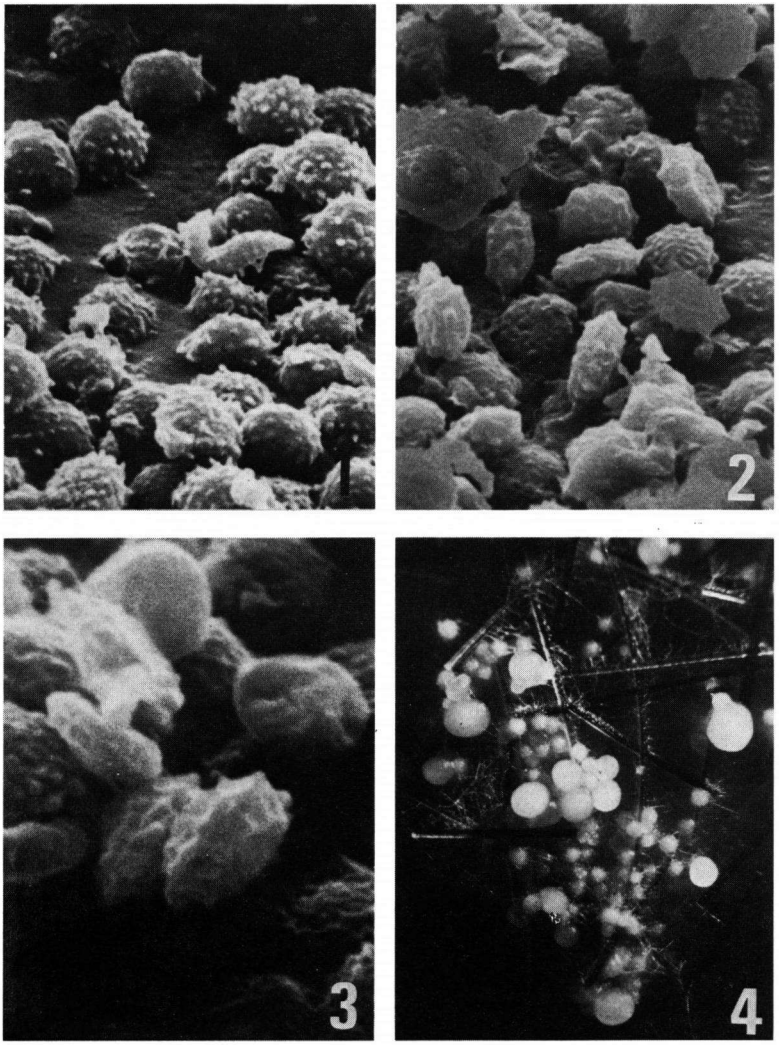
PLATE 39

Fig. 1. *Xanthothecium peruvianum*, ascospores. ×5.000. — Fig. 2-4. *Leucothecium emdenii*. — 2. Ascospores. ×5.000. — 3. Ascospores. ×10.000. — 4. Ascomata grown on YpSs agar with hairs. ×15.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