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Short Report

Aspergillus cejpii, a new species for the funga of Iran

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A thermophilic fungus, identified as *Aspergillus cejpii* (*Aspergillaceae*), was isolated from cultures derived from the cap and gill tissues of *Agaricus bisporus* in Kermanshah, Iran. On potato dextrose agar, colonies exhibited moderate growth, forming white, floccose to lanose mycelial mats (Fig. 1).

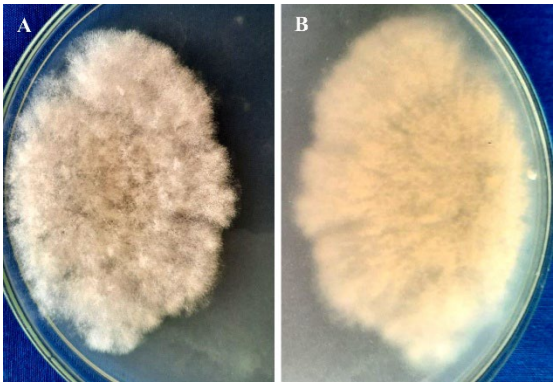

Fig. 1. *Aspergillus cejpii* (IRAN 5349C). (A) colony on potato dextrose agar after 7 days at 35 °C, obverse (B) colony, reverse.

The Vegetative hyphae are hyaline, 2.0–4.7 µm in diameter, frequently forming rhizomorphs. Racquet hyphae, up to 12.5 µm wide, are prevalent (Fig. 2A, B). The fungus produces abundant, discrete, spherical cleistothecia, white to cream in color (Fig. 2C). Cleistothecia originate from tightly wound hyphal coils emerging as lateral branches from vegetative hyphae (Fig. 2D). At the coil base, hyphae forms loosely branching filaments enveloping the coil, which rapidly develope into pseudoparenchymatous cells. The surrounding interwoven hyphae adhere tightly to the developing cleistothecium. Asci, produced via crozier formation, are globose to subglobose, 9.5–11.5 µm in diameter, eight-spored, evanescent, deliquescing as the ascospores mature (Fig. 2E). Ascospores are hyaline, lenticular, with two closely appressed equatorial ridges (~0.3 µm wide) and with convex smooth surfaces, 3.2–3.7 × 3.8–4.5 µm (Fig. 2F, G). Conidiophores arise as long, smooth-walled, septate branches from aerial hyphae, dichotomously branched once or rarely twice at the apex, typically lacking septa between branchlets and the main axis of the conidiophore. Conidia aleuriospores, formed singly or in chains of two to five, hyaline, thick-walled, smooth, subglobose to pyriform, 6.0–10.0 µm in diameter (Fig. 2F, I).

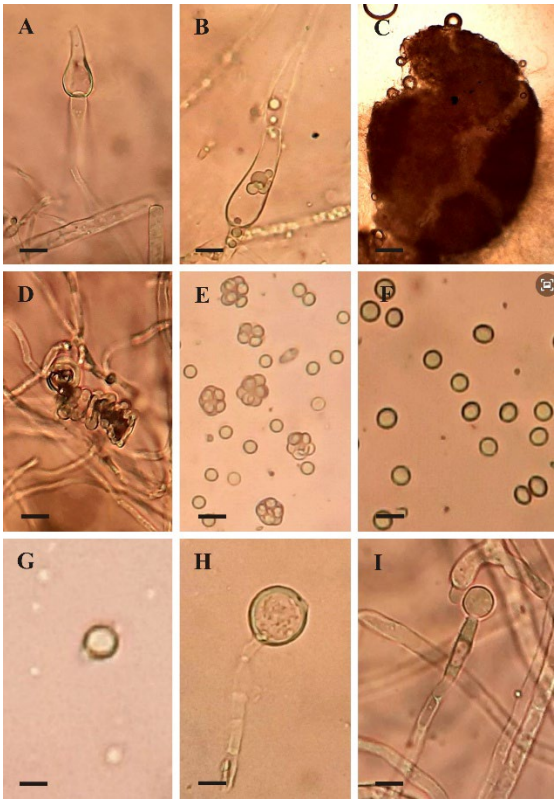

Fig. 2. *Aspergillus cejpii* (IRAN 5349C). (A, B) Racquet hyphae (C) cleistothecium (D) cleistothecial initials (E) asci and ascospores (F, G) ascospores (H, I) conidiophores and conidia. Scale bars: A, B, C, D, E, I = 10 µm; F, G, and H = 5 µm.

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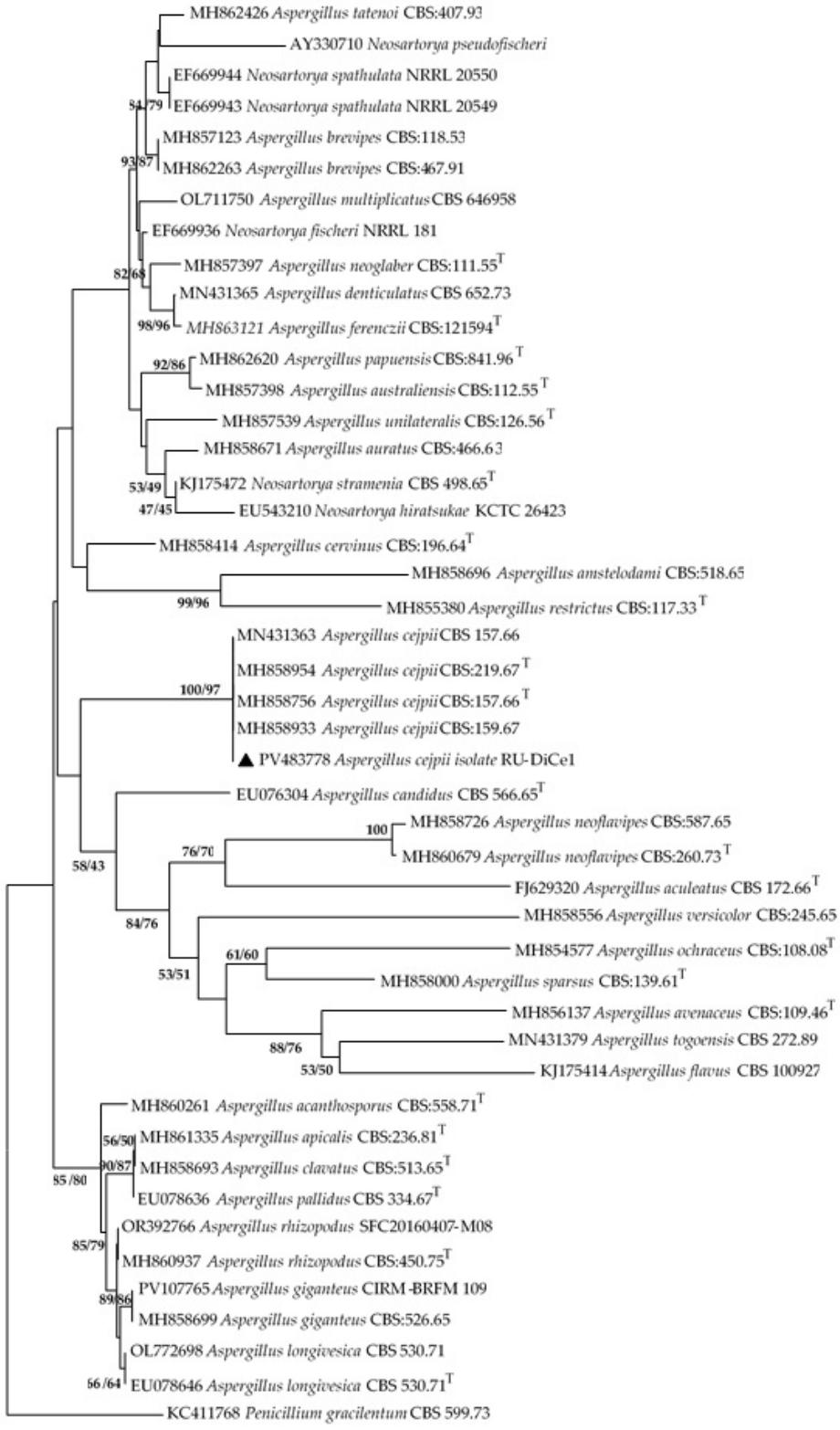

Fig. 3. Phylogenetic tree generated from a maximum parsimony inference based on the ITS sequences dataset. Maximum parsimony and maximum likelihood bootstrap values are indicated at the nodes. The black triangle refers to the Iranian isolate. (^{T} = type strain). The tree was rooted with *Penicillium gracilentum* (CBS 599.73).

Based on morphological characteristics and its comparison with the original description (Scott 1970) and molecular analysis using the sequences of the internal transcribed spacer regions (ITS), the studied isolate was identified as *A. cejpii*. Comparison of sequences of the internal transcribed spacer regions

(ITS1+5.8S+ITS2) (GenBank accession no. PV483778) using the BLAST search showed 99% similarity (three substitutions) to the holotype sequence (CBS 157.66, MH858756) and 100% with the isolate from China (KJ207407). Phylogenetic analyses using maximum parsimony (MP) and maximum likelihood (ML) methods, based on ITS sequence data (Samson et al. 2014), grouped the studied isolate with *Aspergillus cejpii* (Fig. 3). Topologies of the MP and ML trees were congruent, with only minor differences in bootstrap support values, and maximum parsimony (MP) tree is presented here. A voucher isolate is deposited in the Fungal Culture Collection of the Iranian Research Institute of Plant Protection, Tehran, Iran, under (IRAN 5349C). *Aspergillus cejpii*, originally described as *Talaromyces cejpii* by Mil'ko (1964) and later combined as *Dichotomomyces cejpii* by Scott (1970), and was recently transferred to the genus *Aspergillus* (Samson et al. 2014). It is characterized by aleurioconidia on short, dichotomously branched conidiophores and ascospores within cleistothecia (Varga et al. 2007, Samson et al. 2014).

This ascomycete exhibits exceptional thermotolerance, surviving 70 °C for 60 minutes, and is reported from diverse global habitats, including soil beneath decomposing remains, heat-processed products, and marine environments, highlighting its forensic potential (Tranchida et al. 2014). *Aspergillus cejpii* produces bioactive secondary metabolites, including diketopiperazines, indoloditerpenes, polyketides, steroids, gliotoxin, xanthocillin X, tryptoquivalones, and hepatotoxic rubratoxins, with ciliostatic, cytotoxic, and antimicrobial properties (Chen et al. 2017). Previously reported from Slovakia, the Netherlands, Egypt, the United States, South Africa, Pakistan, Japan, Moldova, and India (Varga et al. 2007), this study marks the first record of *A. cejpii* in Iran.

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