

Lepiota locaniensis: an extinct Chilean fungus

Lepiota locaniensis: un hongo chileno extinto

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ABSTRACT

Lepiota locaniensis, an endemic Agaricaceae of Chile, has not been collected over the last 50 years. A statistical analysis of collecting dates suggests that it should be considered an extinct species, following CITES criteria.

Key words: extinction, fungi, Chile.

RESUMEN

Lepiota locaniensis, una Agaricaceae endémica de Chile, no ha sido colectada en los últimos 50 años. Un análisis estadístico sugiere que esta especie debería ser considerada extinta, según el criterio de CITES.

Palabras Claves: extinción, hongos, Chile.

Fungi comprise over 70,000 known species, which may represent only 5% of the true number of species worldwide (Hawksworth 1991). Ectomycorrhizal fungi in Europe have declined in diversity and abundance, possibly due to environmental pollution, and several species are currently regarded as extinct (Jaenike 1991). Whether widespread losses of fungi are taking place elsewhere remains to be established. Here we report the possible extinction of a Chilean Agaricaceae *Lepiota locaniensis* Espinosa, 1936.

The fungi of Chile comprise around 3,300 species, whose conservation status is virtually unknown (Mujica *et al.* 1980, Lazo 1992¹). Of these, around 700 species are Agaricales (Garrido 1985), of which *L. locaniensis* is known due to its role in severe cases of fungal intoxication (Lazo 1982). First reported in 1935 and formally described a year later (Espinosa 1936, Singer 1969), *L. locaniensis* was recorded up to 1946 in three areas surrounding Santiago (Lo Cañas, Maipú and Melipilla), also associated with intoxication events (e.g., Vicuña *et al.* 1944, Cabrera 1946). *Lepiota locaniensis* was observed growing on the ground, solitarily or in clusters of

two or three carpophores, fructifying from May to June (austral winter). At that time, the habitat consisted of pasturelands and semi-arid vegetation (Espinosa 1936, Garrido 1985).

Despite efforts to collect it, *L. locaniensis* has not been recorded since (Lazo 1982, 1992). Collections were attempted by W Lazo from May through July of 1964 through 1967, 1971, 1972 and 1975 at Lo Cañas, and also from May through July of 1964 through 1967, and 1971 at Maipú. No single specimen of *L. locaniensis* was detected there or in other areas such as El Tabo, Peñuelas, Viña del Mar and Pumanque (Lazo 1971, 1982, 1983, Lazo *et al.* 1977; see also Singer 1969). Fungal intoxications have continued to occur in Chile but due to ingestion of species other than *L. locaniensis* such as *Amanita gemmata* (Lazo 1982). This suggests that the absence of medical records for *L. locaniensis* is not biased simply due to increased public perception of toxic species. The forty-seven years elapsed since its last sighting suggests that this fungus may be

¹ Los hongos de Chile. First Workshop on Chilean Biodiversity, National Committee for Biodiversity, Conicyt, Santiago.

extinct (Diamond 1987). According to the criteria adopted by the Convention on Trade in Endangered Species (CITES), extinction is assumed when a taxon has not been definitely located in the wild over a period of 50 years, which is almost the case for *L. locaniensis*.

Extinction can also be statistically inferred from collecting or sighting data, assuming these events occur randomly and the frequency of sightings follows a Poisson distribution (Solow 1993). The time elapsed since the last observation can be tested for departure from an expected Poisson distribution based on the series of previous records. The significance level α to determine whether the absence of records since the last sighting departs from a random distribution is (tn/Tn) , where tn is the time elapsed between the first and last record of the species, T is the observation period between the first record and present time, and n is the number of times the species was sighted or recorded (see Solow 1993 for details). If the time span elapsed since the last record departs significantly from that expected by chance alone, extinction can be presumed.

Lepiota locaniensis was recorded in 1935, 1943, 1944 and 1946, so the observation period was considered to be 1935-1993. Following Solow (1993), we excluded the first record since there is no way to accurately define the beginning of the observation period. Therefore, the number of records is 3. The time elapsed between the first and last record (tn) is 11 years, and the observation period (T) is 58 years. The time elapsed between the last record and the present departs significantly from random expectation were the fungus still extant ($\alpha = 0,006$).

Lepiota locaniensis was restricted to the vicinities of Santiago, therefore the absence of recent records suggests the demise of the taxon rather than the extinction of local populations. The decline of European ectomycorrhizal fungi has been attributed to air pollution (Jaenike 1991). As with European species, the area of distribution of *L. locanensis* is within the most heavily polluted area of Chile (Hajek et al. 1990).

Furthermore, the areas in which this fungus was collected are currently within city limits, including urbanization of prior collecting areas. These factors could have triggered the decline and subsequent extinction of *L. locaniensis*. Eventhough the CITES period to declare a species extinct has not been reached, we agree with Diamond (1987): *L. locaniensis* ought to be considered extinct unless shown extant and secure.

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