Research Paper

Analysis of traditional knowledge for wild edible mushrooms consumed by residents living in Jirisan National Park (Korea)

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ABSTRACT

Ethnopharmacological relevance: This study aims to record and analyze the traditional knowledge of wild edible mushrooms utilized by residents living in Jirisan National Park (Korea).

Materials and methods: Data was collected through participant observations and in-depth interviews with semi-structured questionnaires. Quantitative comparative analyses were accomplished through informant consensus factor (ICF), fidelity level (FL), and inter-network analysis (INA).

Results: The amounts of traditional knowledge recorded from the communities were 158 practices classified within 22 families, 33 genera, and 38 species. The representative families were Tricholomataceae (23.20%) followed by Pleurotaceae (13.10%), Polyporaceae (8.21%), and Hymenochaetaceae (6.33%). The results revealed 24 modes of preparation for the mushrooms, with the most common methods being for preparing them as, seasoned cooked mushrooms (40.75%), soups (13.84%), teas (12.18%), simmered (9.19%), and roasted (6.20%). The informant consensus factor (ICF) values in the ailment categories were birth-related disorders (1.00), genitourinary system disorders (1.00), other conditions (0.91), circulatory system disorders (0.76), and diabetes (0.33). In terms of fidelity levels, five mushroom species showed 100% of fidelities.

Regarding the inter-network analysis (INA) of mushrooms and ailments, the positions of medicinal mushrooms is distributed into three main groups. Also, regarding the network of mushrooms and foods, the location of edible mushrooms is distributed into two main food groups.

Conclusion: The utilization of the inter-network analysis has been used typically within the social sciences for the analysis of social trends and phenomena through the interrelationship of specific social components, from this study it is being applied for the interpretation of traditional knowledge utilizing mushrooms in the local communities. Through this study, we are confident that the useful application of the inter-network analysis has been successfully proven.

1. Introduction

Concerns regarding the practical use of wild edible fungi have considerably increased worldwide (Merlo and Croitoru, 2005; Pettenella and Kloehn, 2007). The marketability of some species reaches an estimated annual income of more than two billion dollars (Wang and Hall, 2004). The collection of fungi for consumption and trade is vital for rural livelihoods in local communities (FAO, 2004). However, the investigative research of wild edible mushrooms is limited when compared with other vegetables.

Within the last 10 years, the traditional knowledge of wild mushrooms in the local communities has been actively investigated worldwide, with studies conducted in Spain in Europe (Agelet and Vallès, 2003), Nepal in Asia (Christensen et al., 2008), Mexico in the Americas (Jarvis et al., 2004), and Tanzania in Africa (Tibuhwa, 2012).

In Korea, its people have used mushrooms for food and medicinal usage from ancient times. Lately, a few cultivated mushrooms were strictly focused on as a nutrient and nutraceutical source for commodities (Cho, 1998a). This trend in Korea has resulted in the gradual to disappearance of the traditional knowledge of wild edible mushrooms.

Jirisan National Park was established as the first national park in Korea in 1967 and has successfully preserved its traditional culture and natural ecosystem due to the Biodiversity Conservation Policy of the government.

The fungi flora of Jirisan National Park totals 409 species, included within 65 families and 170 genera. Within these species, the total includes 135 edible species, 16 cultivated species, 35 poisonous species, 69 medicinal species, 51 ectomycorrizhae species, and 177 wood-rotting species (Cho, 1998b).

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2. Research area and methods

2.1. Environmental characteristics of the research area

The study area is located in the center of the southern region in Korea and lies between 35° 13′ N to 33° 27′ N latitude and 127° 27′ 50″ E to 127° 49′ 50″ E longitude (Fig. 1). The area measures 485 km^2 including two provinces, one city, and four counties in its administrative districts (Korea National Park Service, 2013).

The annual average temperature is 11–14 °C and the annual precipitation is approximately 1200–1600 mm (Yim and Kim, 1992). The climatic zone of vegetation is distributed between a warm temperate zone and a subarctic zone, consisting typically of a deciduous broad-leaved forest (below 1400 m above sea level), a coniferous forest (above 1400 m), and a shrubbery forest (peak area above 1800 m) (Yim and Kira, 1975; Yim and Kim, 1992).

2.2. Investigative method

Data was collected using participant observations and in-depth interviews, as the informants also become investigators themselves through attending informal meetings, open and group discussions, and overt observations with semi-structured questionnaires (Kim and Song, 2011a, 2011b).

The content of the semi-structured questionnaires was composed of diverse informations about mushrooms, including local names, used-parts, ailments, methods of preparation, manufacturing and administration, dosage, and the usable duration (Martin, 1995; Kim and Song, 2011a, 2011b).

All mushroom specimens were gathered during their collecting seasons and were organized utilizing the normal specimen manufacturing method (Martin, 1995; Kim and Song, 2008). The voucher specimens were deposited for preservation in the herbarium of Jeonju University. The precise identification of mushrooms mentioned by the informants was performed in accordance with Lee and Hong (1985), Park and Lee (1999) and Seak and Kim (2010).

2.3. Quantitative analysis

2.3.1. Informant consensus factor (ICF)

The ICF was used to analyze the agreement degree of the informants' knowledge about each category of diseases (Heinrich et al., 1998, 2009). The ICF was calculated using the following formula:

$$ICF = (n_{ur} - n_t)/(n_{ur} - 1),$$

where n_{ur} stands for the number of use reports of informants for a particular disease category and nt is the number of species used by all informants for a particular ailment.

2.3.2. Fidelity level (FL)

The FL was employed to determine the most important mushroom species used for treating certain diseases by the local herbal

Table 1
Demographic characteristics.

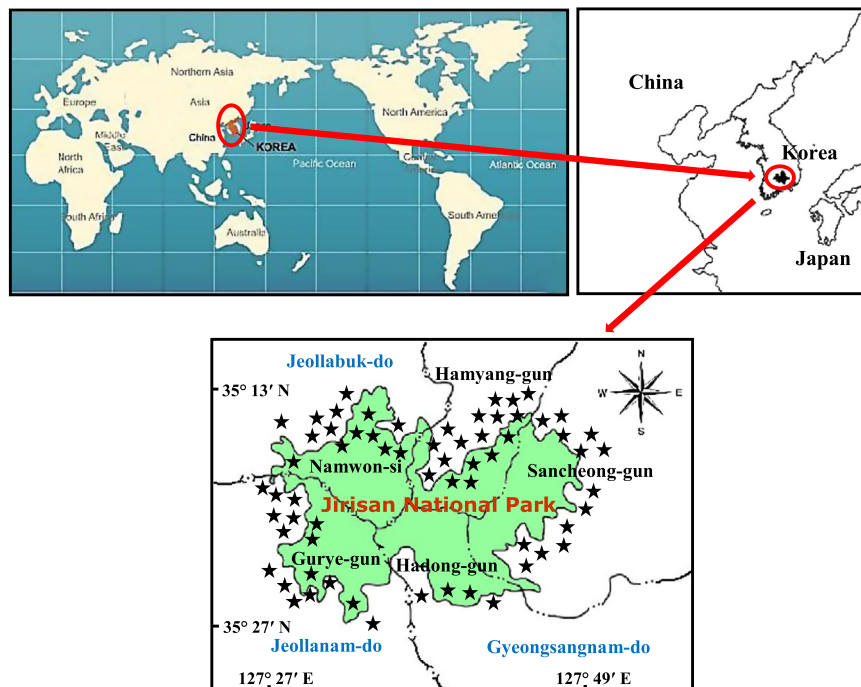|	
Gender	
Male	99 (41.1%)
Female	142 (58.9%)
Age	
40–49	1 (0.4%)
50–59	11 (4.6%)
60–69	54 (22.4%)
70–79	132 (54.8%)
80–89	38 (15.8%)
90–99	5 (2.1%)
Educational attainment	
Never attended school	151 (62.7%)
Attended school for less than 6 years	18 (7.5%)
Attended school for 6 years	27 (11.2%)
Finished middle school	20 (8.3%)
Finished high school	25 (10.4%)

Fig. 1. Investigation sites.