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Supplementary materials

The cultivation of *Lactarius* with edible mushrooms

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Supp. Table 1 - Some species of *Lactarius* purported to have edible mushrooms with countries listed by Boa (2004) or Wang (2020). According to the Index Fungorum many species listed by Boa (underlined in yellow) would be better housed in the genus *Lactifluus.*

Botanical name	Chinese common names	Countries
Lactarius abieticola	lengshanrugu 冷杉乳菇	China
L. acris		Ukraine
L. akahatsu	chenghongrugu 橙红乳菇	China
L. angustus		Congo
L. baliophaeus		Benin
L. camphoratus	xiangrugu 香乳菇	China
L. carbonicola		Mexico
L. chrysorrheus	huangzhirugu 黄汁乳菇	Russian
L. cinnamomeus	huangherugu 黄褐乳菇	China
L. congolensis		Congo
L. controversus		Ukraine
L. corrugis		Guatemala
L. deliciosus	songrugu 松乳菇	Armenia, Belarus, Bulgaria, Canada, Chile, China, Costa Rica, Greece, Guatemala, Jordan, Kyrgyzstan, Mexico, Nepal, Poland, Russian, Spain, Turkey, Ukraine, Uruguay, United States of America
L. densifolius		Benin
L. deterrimus	yunshanrugu 云杉乳菇	China, India
L. edulis		Benin, Burundi, Congo
L. fennoscandicus	beiourugu 北欧乳菇	China
L. flammans		Benin
L. flavidulus		Russian
L. glyciosmus		Ukraine
L. gymnocarpoides		Benin
L. gymnocarpus		Malawi, Senegal, Tanzania, Zambia
L. hatsudake	hongzhirugu 红汁乳菇	Bhutan, China
L. helvus		Ukraine
L. hengduanensis	hengduanshanrugu 横断山乳菇	China
L. hygrophoroides	xizheduozhirugu 稀褶多汁乳菇	China
L. indigo	lanlvrugu 蓝绿乳菇	Costa Rica, Guatemala, Mexico
L. insulsus		Russian, Ukraine

L. inversus		Burundi, Congo
L. japonicus		Russian
L. kabansus		Burundi, Congo, Tanzania, Zambia, Zimbabwe
L. latifolius		Benin, Congo
L. lignyotus	heirugu 黑乳菇	Ukraine
L. luteopus		Benin
L. mitissimus		Costa Rica
L. necator	chalvrugu 茶绿乳菇	Belarus, Russian, Ukraine
L. pallidus		Ukraine
L. pelliculatus		Tanzania
L. pelliculatus f. pallidus		Congo
L. pergamenus		Bulgaria
L. phlebophyllus		Tanzania
L. piperatus		Bhutan, Bulgaria, Malawi, Mexico, Nepal, Russian, Turkey, Ukraine, Zambia
L. porninsis	boningrugu 波宁乳菇	China
L. princeps		India
L. pseudogymnocarpus		Benin
L. pseudohatsudake	jiahongzhirugu 假红汁乳菇	China
L. pseudovolemus		Congo
L. porninsis	boningrugu 波宁乳菇	Ukraine
L. pubescens	rongbianrugu 绒边乳菇	Russian
L. pumilus		Benin
L. pyrogalus		Russian
L. quietus	youweirugu 油味乳菇	China, Ukraine
L. repraesentaneus	fushengrugu 复生乳菇	Russian, Ukraine
L. resimus		Russian, Ukraine
L. rubidus		United States of America
L. rubrilacteus		Guatemala, United States of America
L. rubroviolascens		Madagascar, Tanzania
L. rufus		Russian
L. rugus		Ukraine
L. salmonicolor		Guatemala, Mexico, Turkey
L. sanguifluus	xuehongrugu 血红乳菇	China, Mexico, Spain, Ukraine
L. saponaceus		Benin

L. scrobiculatus	wobinghuangrugu 窝柄黄乳菇	Mexico, Russian, Ukraine
L. semisanguifluus		Ukraine
L. sesemotani		Congo
L. subdulcis		Mexico, Ukraine
L. subindigo	yadianlanrugu 亚靛蓝乳菇	China
L. subzonaruis	xiangyahuanrugu 香亚环乳菇	China
L. tenellus		Benin
L. torminosus	maotourugu 毛头乳菇	Belarus, Bulgaria, Russian, Ukraine
L. trivialis		Russian
L. uvidus	jinzirugu 堇紫乳菇	China
L. vellereus		Bulgaria, Costa Rica, Malawi, Mexico, Russian, Ukraine
L. vietus		Ukraine
L. violascens		Ukraine
L. vividus	lianglirugu 靓丽乳菇	China
L. volemoides		Benin
L. volemus	duozhirugu 多汁乳菇	Bulgaria, China, Lao People's Democratic Republic, Mexico, Nepal, Russian, Turkey, Ukraine
L. yazooensis		Mexico
L. zonarius	huanwenrugu 环纹乳菇	Ukraine

Note well: The edibility of some species is questionable and the edibility of any of the species listed above should be treated with caution. Below we repeat the warning from the book Edible and Poisonous Mushrooms of the World" (Hall et al. 2003).

Some poisonous and edible mushrooms are easily confused. So, before eating any mushroom, be absolutely sure of its identity and edibility. For mushrooms that are not illustrated in this book or that are known to vary in appearance from the illustrations included in the book, it may be necessary to consult other texts listed in the Bibliography, or a mushroom specialist. But please note that the edibility of many mushrooms is still unknown and in any event when trying a mushroom for the first time only eat a small amount. **If you have any doubts whatsoever as to the identity and edibility of a mushroom, DO NOT EAT IT.** Whenever you eat wild mushrooms or a new cultivated mushroom always put some uncooked ones aside in the refrigerator in case you have made a mistake or have an allergic reaction to the mushroom. **If you experience any illness after eating a mushroom, consult a doctor immediately.** Reasonable efforts have been made to publish reliable data and information, but the authors and publisher cannot assume responsibility for the validity of all materials or for the consequences of their use. The publishers and the authors can take no responsibility for the misidentification of mushrooms by the users of this paper nor any illness that might result from their consumption.

Supp. Table 2 - Range in soil test analyses (Eurofins, New Zealand) where *Lactarius deliciosus* grows well in Europe and New Zealand.

pH (water)	3.5 - 6.5
Total calcium (%)	0.2 - 0.7
Extractable calcium (QT)	>1 - 14
Organic carbon (%)	1.2 - 26.8
Total nitrogen (%)	0.05 – 0.33
Carbon/nitrogen ratio	9.1 – 32.7
Extractable phosphorus (µg/g)	1 - 84
Extractable potassium (QT)	1 - 19
Extractable magnesium (QT)	9 - 58
Extractable sodium (QT)	5 - 17
Extractable sulphur (µg/g)	2 - 111
Extractable iron (µg/g)	520 – 5860
Extractable boron (µg/g)	0.44 - 2.77
Extractable copper (µg/g)	1.6 - 2.4
Extractable manganese (µg/g)	61 - 145

Supp. Fig. 1 – Two of Invermay Agricultural Centre's no longer used edible mycorrhizal mushroom greenhouses near Mosgiel, New Zealand. The Pinus radiata plantation less than 100 m away on the hill is thought to have been the source of repeated contamination by rogue ectomycorrhizal fungi in the early 2000s.

Supp. Fig. 2 – A Pinus radiata plantation near Castlemaine, Victoria, Australia, photographed in June with a standing crop of saffron milk cap estimated by I. Hall (unpublished) to be between 100 and 200 kg per hectare.

Supp. Fig. 3 – Prolific fruiting of *Lactarius deliciosus* in Hannes and Theres Krummenacher's plantation near Nelson, New Zealand, about 10 years after planting. Wild mushroom pickers often report that Lactarius deliciosus is often found in areas of forest where dappled sunlight reaches the ground. We estimate that when these mushrooms were picked, this patch produced more than 3 kg.

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