CHECK LIST OF MUSHROOMS ASCO. AND GASTEROMYCETES OF KAGHAN VALLEY III.

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ABSTRACT: *The present list includes 31 species belonging to 15 genera of different families of Ascomycetes (Macromycetes) and 44 species belonging to 17 genera of different families of Gasteromycetes from Kaghan valley. Taxonomically they were treated after Ahmad (1950b). Two genera of Ascomycetes: Morchella and Tuber and three genera of Gasteromycetes: Calvatia, Lycoperdon and Langermmania were edible and medicinal too. Many of them were medicinal. Calvatia is the origin of calvacin and Morchella of interferon drug. Besides the edible mushrooms most of them were medicinal as reported in Chinese medicines. These were collected mostly from Scharhan, Kamal ban, Shogran, Naran and Lalazar localities ranging from 5000 to 9000 feet. More over the forest become scanty in alpine (upper most) region, however at Babusar top (13684 feet) few Gasteromycetes were growing under Juniper bushes*.

Keywords: Check list, mushroom, Kaghan valley

INTRODUCTION:

The Kaghan valley is one of the most beautiful places in Pakistan. It is subtropical continual region of Hazara[6]. It is situated between 34 30'to 35 15'latitude N and 73 18' to 74 5' longitude E. It extends over about 160 km rising from an elevation of 1,343 meters to its highest point, the Babusar Pass at 4150 meters (13684`). This valley lies in the North of district Mansehra of Hazara Division, North West Frontier Province (N.W.F.P.). It is at its best in the summer months, 12^oC and minimum 3.3^oC from the middle of May up to the middle of October. [14] divided the Hazara division into three major zones. Later the whole Kaghan valley was divided into four Ecological zones [11]: 1) Sub tropical pine zone: Balakot, Kewai, Mahandari, Baunjasharif. 2) Temperate zone (Trans - Himalayan): Scharhan, Kamal Ban, Shogran, Sari hut, Bella, Kaghan.3) Subalpine (Trans Himalayan): Naran, SaifulMaluk, Lalazar, Batakundi, Burawai&Besal. 4) Alpine (Trans-Himalayan): Lulusarlake, Gittidas, Babusar.

The Kaghan valley is drained by the River Kunhar. The average rain fall for spring, summer and winter are 14.3, 25.8, and 7.5 inches respectively. The snow fall received annually at Jared (1333 m) up to one meter average; Kaghan: (2221 m) 3-3 m; Shogran: (2583 m) 3-4 m; Naran: (2333 m) 6-7 m and increasing above in Trans-Himalayan and Alpine zones. This valley is at its best in the summer months from May to September. The climate in summer remains moderate. Major work on taxonomy of fungi of Pakistan was done by Dr. Sultan Ahmad (1910-1983), who published about 172 research papers. Since 1939 to 1952 he worked on Gasteromycetes and published a dozen of papers in different journals and then compiled monograph on Gasteromycetes of Pakistan (1952), he described 62 species of 26 genera. In 1955 he recorded 20 species of pezizales including two species new to science. In 1956 a monograph no. 1 entitled Fungi of Pakistan. In 1962, 1964 & 1977 enlist the fungi under the title "contribution to the fungi of Pakistan". [6] published supplement to Monograph 1, the fungi of Pakistan. [10]studied some higher fungi. In 1978 the monograph no.7 part 1 entitled `Ascomycetes of Pakistan` was published. [19] compiled all the published work on fungi in "the Fungi of Pakistan". [8] added two species of Gasteromycetes along with other fungi under the title "Contribution to the fungi of Pakistan" in the Bulletin of Mycology. [17]reported four edible fungi from Baluchistan. [18]reported about 91 wild and exotic mushrooms in Pakistan (PL 480 project) from different parts of the country. [12]published an article on edible Discomycete and Gasteromycetes of Pakistan and India. [21] reported the prized mushroom (*Morchella* species) in 'progressive farming' journal. The Japanese scientists during the Cryptogamic Expedition of Northern areas 1991-1993, these scientists along with the other fungi recorded many higher fungi. [20]described the larger fungi of Pakistan with the addition of four specie of pezizales. [23], worked on diversity of edible mushrooms in Pakistan. The fungi of Pakistan have been compiled by [9]. [15]described seven species of Gasteromycetes from Azad Jammu and Kashmir. Khalid 1998, described few Gasteromycetes along with the other macro fungi. In addition to the above described literature the following books were consulted for identification: [13;16, 22; 24]. These studies showed that the larger fungi belonging to Ascomycetes and Gasteromycetes flora of Pakistan is extremely rich. The described species seem to be a fraction of the fungal flora which remains to be described.

The present checklist is available in the repository of Mycological Herbarium, Pakistan Museum of Natural History, Garden Avenue, Shakarparian, Islamabad which aims to provide a permanent repository for continuous updates about mushrooms and Gasteromycetes of Kaghan valley, with no avoidable delay, and to make the data available to all mycologists working in Pakistan as well as in the world. The authors would appreciate receiving comments and notifications from mycologists, curators of herbaria containing Pakistani material, and authors of publications treating Pakistani specimens. Please send comments to the corresponding author's address.

MATERIALS AND METHODS:

The species cited were collected by the author herself and Muddassar Fida, Sr. collection Incharge. The sun – dried samples were identified by comparing their field data and microscopic characteristics with the existing literature. Morphology and measurements of macro and micro characters were considered for the samples and then deposited in the mycology herbarium of Pakistan Museum of Natural History, H-7, Shakarparian, Islamabad Pakistan. Edibility was recorded from literature and locals. The first time recorded species for Pakistan are indicated by an asterisks mark (*).

RESULTS AND DISCUSSIONS:

Sub-Class:**GASTROMYCETIDAE** (STOMACH FUNGI)

Hymenium inside the fruit bodies or later become free**.**

Family:**Phallaceae**

Mature hymenium (gleba) gelatinous, on outer face of the receptacle, emerging from the volva like base, unexpanded juvenile state like a bird's egg. Confined to maritime and sand dunes and in woods of all kinds, it emits bad smell like of hydrogen sulphide (H_2S).

Genus: *PHALLUS*L. ex Pers.

Unexpanded basidiocarp globose to ovate, mature fruit body like a stinkhorn.Basidia 6-8 spored. Spore mass mucilaginous, olive green, spread over the outside of the pileus. Spores elliptical, smooth, tinted.Growing solitary on the ground.

Phallus impudicusL. ex Fr.(Insect killer)

Mature fruit body is like a stink horns. It is like an egg, white or pinkish attached by a long branched rhizomorphic hyphal strand. Stipe soft, long pink, pitted. Pileus companulate with white ring at the top, volva at the base. At maturity it emits undesirable smell. Not edible but recommended as insect killer, it emits H_2S volatiles, smelling like dirty egg in the surrounding, which also guide the collector in the forest.

On soil, Kamalban,

Phallus rubicundus(Bosc.) Fr.: Sacc.

Ithyphallusrubicundus (Bosc.) Fischer,

On ground, Balakot, Mahandari, [3]:67, [5]1956:84.

Genus**: HYSTERANGIUM,** Vitt.

Fruit body subterranean or partly exposed, subglobose, not stalked. Spores elongated, slightly or distinctly rough.

Hysterangium affineMassaa& Row.

Shogran, [25]:181**.**

Family:**SPHAEROBOLACEAE**

Sporophore sessile containing one viscid, peridiole,

Genus:**SPHAEROBOLUS,** Tode ex Pers.

Fruiting bodies globose to sub globose, whitish to pale yellow opening to form a star, splitting in to 68 triangular, yellowish lobes allowing the expulsion of gleba in a single gelatinous sphaeroidal mass, at first transparent then brown. Outer surface covered by a sparse mycelial layer. Spores white, elliptical smooth. Growing on rotting debris, brambles sticks, leaves of saw dust mostly in autumn, on dung, not edible.

SphaerobolusstellatusTode ex. Pers.

Sphaerobolusstercorarius Fr.

Sphaerobolustubulosus Fr.

*Carpobolusstellatus*Desm.,

On dung & dead branches.Lalazar 25.9.90, PMNH no 754.

Family:**Nidulariaceae**

Spores embedded in small and hard seed like peridioles, all spores enclosed in peridium, which open irregularly or so as to resemble a vase or nest.

Genus:**CRUCIBULUM** Tul.

Fruit body cup shaped or bell shaped, sessile on twigs. Peridioles numerous, almost filling the cup and attached to it by simplefuniculus.Basidia forming a distinct closely packed hymenium surrounding a narrow central area.Basidia long, clavate, thick and swollen at the tips. Spores are stick together by their surfaces and do not fall out when exposed, hyaline, elliptic and varying greatly in size.

Crucibulumlaeve, Huds.exRelh.)

Bird`s nest fungus.

Fruit body at first globose, then drum shaped, orange, yellow, inner and surface, pale smooth, peridioles lens shaped pale creamy or light brown. Tiny, usually found in moist shady place on deteriorating logs and branches etc.

On rotten branches, Kamal ban, 24.09.1990, no. 280, 787.

Crucibulumvulgare Tul.;Sacc.

On ground, Shogran, [3];[5]; [25].

Genus:**CYATHUS,** Brown ex Pers.(Bird's nest fungus)

Fruit body bell shaped. Peridioles attached by the cord in the centre. Basidia not forming a distinct or homogenous hymenium but scattered at irregular height throughout the large central area.Basidia long clavate with 4 sessile spores. Spores scattered in the central horney tissues, elliptic, hyaline rather thick walled.

Cyathus olla Pers.

On soil, Babusar, 27.08.1989, no.192; Sharhan (upper bella), 24.8.1989, no. 98, Naran, 28.08.1989, no. 93, Kamal Ban, 24.09.1990, no. 756 & 78.

Family:**Tulostomaceae**

Fruit body globose, with dry, powdery, gleba at the apex and tall cylindrical stipe.

Genus:**TULOSTOMA**Pers. ex Pers.

Fruit body stipitate, head globose and slightly flattened grayish white with an apical pore. Stipe whitish to ochraceous, smooth or flaking on drying. Capillitium threads branched,septate, usually attached to the inner wall of the peridium. Spores slightly warded. Usually found in dry and sandy regions and maritime dunes, not edible.

Tulostomabrumale, Pers

Collected from sandy soil, under broad leaved bushes at Naran, inedible.During rainy season.On sandy soils, Naran, 25.08.1989, no. 82.Medicinally used in Chinese medicine.

Family:**Hymenogastraceae**

Fruit body leathery subterranean, globose to sub globose.

Genus:**RHIZOPOGON**Fr.

Fruit body sub globose, on the surface of ground or buried up to several inches in humus soil. Peridium tough and covered with brownish thread like rhizoids. Basidiasubclavate to nearly cylindrical, collapsing after spore formation. Spores smooth, elliptic, pale olive, the sterigmata short or none, sometimes represented by a little cup which remains attached to the spore, Ectomycorrhizal mushrooms.

***Rhizopogonobtextus,** (Spreng.) Rauschert.

(Rhizopogonluteolus)

Commonly found under pine vegetation, on soil, Naran, 25.08.1989no. 95, 46.

Genus:**SCLERODERMA,** Pers.

Fruit body sessile or stipitate, usually epigeal.Gleba divided into small irregular chambers. Capillitium absent. Spores are generally large, echinulate or reticulate, dark colored. Edible and the Chinese use it as autoimmune skin disease; it is anticancer and anti inflammatory medicinal properties.

***Scleroderma areolatum,** Ehrenb.

Slightly subterranean, commonly found under broad leaved forest. Edibility not confirmed. On soil, Shogran, 30.8.1989, no. 152.

Scleroderma bovista, Fr.

On soil, Naran, 09.07.1989, no. 127; Kamal Ban, 24.09.1990, no. 785

***Scleroderma citrinum,** Pers.

On soil, Shogran, 26.09.1990, no. 783.

Scleroderma flavidum Ell.&Ev.;Sacc.

On ground, [5],[5].

Scleroderma sinnamariense Mont.

Kamalban, [25].

Scleroderma verrucosum(Vail.)Pers.

Kaghan valley, [3]; [5].

Family:**Geastraceae**

Peridium with 3-layered wall. The outer most is a thin mycelial layer adhering to a thicker fresh layer, when mature these strips crack away from the 3rd innermost layer. A papery wall enclosing the powdery gleba.Dehisces by an apical pore.

Genus:**GEASTRUM**Pers.

(Same as above)

All the species are edible and medicinal, used in combination with other fungi.

GeastrumclelandiiLloyd., Ahmad,

On ground, Kaghan, [3];[5].

Geastrum fimbriatum(Fr.) Fisch.

Naran, [25]

***Geastrumhygromitricum*,** Pers., Sacc.

On ground, Kaghan valley, [5]

Geastrumnanum, Pers.

On rubbish heaps in woods. Burawai, 28.08.1989, no. 103; Babusar, 27.08.1989, no. 99.

GeastrumrufescensPers. ex. Pers.,

Shogran, [6];[25].

Geastrumsaccatus, Fr. ;Sacc.,

On ground, Kaghan, [3];[5].

Geastrumschmidelli, Vitt.;Sacc.,

On ground, Shogran, [3];[5]1956:82.

***Geastrum sessile,** (Sow.) Pouz.

On the way to SaifulMaluk, 09.07.1989, no. 113; Kamal ban, 24.09.1990, no. 468.

Geastrum triplex, Jungh.,Sacc.,

On ground, Shogran, [3];[5]; [25].

Family:**ASTARACEAE**

Fruit body partly hypogeal, globose, viscous, 6 - 8 rayed star, reacting strongly to moisture, expanding when damp, rolling tightly when dry. Glebadark grayish. Spores chocolate brown, round warty, odor and flavor negligible.

Genus:**ASTRAEUS,** Morgan,

Fruit body hypogeal, with a basal strand.Peridium specialized. Gleba without cavities and organized hymenium.Capillitium arising from the whole inner surface.Basidia club shaped, irregularly arranged. Spores irregularly scattered.

Edible, Anticancer, having water soluble glucan; D-galactose.

Astraeus hygrometricus, (Pers.) Morg.edible

On soil under the pine forest, on the left side of Bhunja river, 21.07.1989, at 8000 ft, no.114; Kamal Ban 24.09.1990, no. 767; [3].

Family:**LYCOPERDACEAE**

Fruit body spherical to pear shaped with two layered peridium the outer layer breaking up into scales.

Genus:**LYCOPERDON,** Tourn. ex Pers.

Fruit body globose to sub globose or pyriform, with a pitted sterile base and defined as apical pore. Capillitium threads long branched, septate or not, colored or hyaline, attached by one end to the endoperidium or pseudo columella. Spores sub globose, hyaline or colored, verucose or echinulate, pedicillate or not. Found everywhere in moor during rainy season, edible when gleba is white. Found in groups or solitary in grassy places, forest floor or on decaying wood or stumps in woods. They are also known as puff balls, balls of the earth. They are cooked like eggs. Generally they are pain killer, for stomach ach, the powder of spores is used as antibacterial, on the injuries of animals, when they far flung away from the city; it is the only cure in the forest.

Lycoperdonechinatum, Pers.

On soil upper Bella, Kaghan, 24.08.1989, no. 105.

Lycoperdonoblongisporum, Berk.& Curt.

On ground, Shogran, [3]; [5].

Lycoperdonperlatum, Pers. Edible

On wood, Kamal Ban, 10.07.1989, no. 122; On soil, Kamal Ban, 10.07.1989, no. 129; On soil, Naran, 25.08.1989, no. 124;On soil under broad leaves forest and juniperous bushes, Babusar village, 27.8.1989, no. 147; [5].

LycoperdonpolymorphumVitt.;

On ground Kaghan Valley, [3];[5].

LycoperdonpratensePers.; Ahmad,

On ground.Kaghan valley, no. 192, [5]1956: 81.

LycoperdonpusilumBatsch.ex Pers.,

Batakundi,[25].

Lycoperdonpyriforme, Schaeff.ex Fr.

On soil, Lalazar, 28.08.1989, no. 42 & 151; on soil, Burawai, 28.08.1989, no.43; On wood Shogran, 30.08.1989, no. 44; on soil, Naran, 25.08.1989, no. 47, 120; on wood, Shogran, 30.08.1989, no. 48; On soil, Kamal Ban, 10.07.1989, no. 123; [3]: 20, Shogran, [25].

LycoperdonrimulatumPeck; Coker,

Sharhan, [5].

***Lycoperdonspadiceum*,** Pers.

On soil, Shogran, 30.08.1989, no. 134.

Edibility: all the species of the genus Lycoperdon are edible delicious beware of any tinge of yellow colour in the interior. One overage specimen (mature) can spoil the whole dish.

Genus:**CALOSTOMA,** Desv.

Fruit body spherical, subterranean. The exoperidium breaks in to pieces as the plant emerges and falls off completely or in parts exposing the inner thin layer. It opens by a slit in the centre. Basidia ovate or pyriform, irregularly

arranged throughout the internal tissues. Spores sessile, variable in number 5-12, oblong, elliptic to globose.

***Calostomajaponicum,** P. Henn.

Sharhan, 24.08.1989, no. 145.

Genus:**BOVISTA**Pers.

Fruit body globose, gleba white then yellow and finally powdery olive brown. Capillitium not connected with peridium, branched with tapering ends. Spores dark brown with pedicel or purplish brown in few species. Common in lawns, pastures and dunes grounds as kitchen vegetables and medicinal use.

***Bovistanigrescens*,** Pers. ex Pers. Edible

Edibility: Young fruit bodies (still white button the outside and inside, can be collected for eating.

On soil Lalazar, 28.08.1989, no. 41; Burawai, 28.08.1989, no. 133; Scharhan, 24.08.1989, no. 136; Kamal Ban, 25.09.1990, no. 782; Shogran 28.08.1989, no. 37.

***Bovistaperlatum,**Pers.

On soil, Shogran, 30.08.1989, no. 39.

Bovistaplumbea, Pers.

On soil Shogran, 30.08.1989, no. 101; Lalazar, 28.08.1989, no. 118, 119, Burawai, 28.08.1989, no. 148, 149; [3]; [5].

Bovistabovistoides, Cke.& Mass.

Sari Hut, 8.5.1990, no. 7.

Genus:**Rhizopogon,** Fr.

Fruit body globose to sub globose, often hypogeal, sessile. The hymenium lines the irregular schizogenous cavities. Capillitium lacking, nonmscidgleba, Spores smooth, hyaline.Edible and are usually consumed for their supposed medicinal value.

RhizopogonflavusPetch.

On ground, Shogran, [5].

Genus:**Secotium,** Kze.

Fruit body above the ground with a long or short stalk.Peridium tough and persistent, gleba spongy. Dehiscence basal and longitudinal.Basidiaclavate, spores smooth or rough.Vegetable & medicinal in china**.**

Secotiumacuminatum, Mont.; Sacc.,

On the ground Shogran, [5].

Genus:**CALVATIA,** Fr.

Fruit body large to globose or pyriform etc. Capillitium composed of large much branched threads. Spores globose with a small sterigmate.Common in woods of pine and spruce also in pastures and grassy grounds. Edible and medicinal, Calvacine is extracted as anti-cancer product. It is usually used to staunch bleeding for healing wounds.

Calvatiacyathiformis, (Bosc.) Morgan

Growing around the trees, on soil, roots of trees, Shogran, 26.06.1989, no. 817, 784.Naran, 25.08.1989, no. 142.[3].

Calvatiaelata, Fr.

Shogran, 26.09.1990, no. 784a.

Calvatiasculpta, (Hark.) Lloyd.

On soil, Burawai 27.08.1989, no. 91.

Edibility: Medium.

Class:**ASCOMYCETES**

Ascomycetes are usually regarded together with Basidiomyce tes as

higherfungi.Thecommonfeature of all Ascomycetes is the pro duction of spores in spore-sacs (asci), mostly often eight to an ascus interspersed with parallel hyphae called paraphyses. Their fruit bodies may be a flat crust; a disc; saucer or cup or convoluted mass. Some gelatinous fruit bodies are also found in this class.

subclass:**Pezizomycetidae,** (Discomycetes)

Hymenium covering the upper surface of a cup-disc or club shaped fruit bodies vary in size.

Order:**Pezizales:**

Asci cylindrical, thin walled flat apex, opening by a lid called operculum. Mostly rather fleshy fungi, often bright coloured.

Family: **Morchellaceae**

Spores smooth, without guttules but with small external granules at the poles e.g. Morchella.

Genus:**MORCHELLA,** St. Amans, (Morels Edible)

Fertile portion strongly ribbed and pitted on a large scale, conical to spherical, seated on a well developed cylindrical stalk. It is mycorrhizal mushroom.

All the species of *Morchella* are edible found in the Northern area of Pakistan (under pine forest). Anti tumor drug is extracted from this mushroom. It is rich in vitamin E; its usein the diet found to improve the infertility in men-1995. It is not yet cultivated anywhere in the world over. The locals collect these mushrooms, dry them and sell in the local market. It is known as Ghuchi and appears on the humus soil under the pine forest, from March to April in the areas of pine vegetation where the needles remain covered with snow during winter. It has several medicinal properties, antibacterial, antiviral, anticancer, its mycelium have antioxidant activity. It is traditionally used in Chinese medicine, indigestion, excessive phlegm and shortness of breath.

Morchellaconica, Pers.

On soil, Jrade, Kaghan 10.05.1990, no. 7900 and 7928.

Morchellacrassipes, Vent.ex Fr. Sacc.,

On ground, [1]; [5].

MorchelladeliciosaFr.; Sacc.

On ground,[2]; [5].

***Morchellaesculenta*,** (L. Pers.)

On soil, Sari hut, 08.05.1990. PMNH no. 7871.

Morchella vulgaris,(Pers. Bound.)

On soil, Shogran, 08.05.1990, no. 7903.

The localities of this valley has been surveyed are: Nadi, Scharhan, Shogran, Kamal ban, Naran, Kaghan, Lalazar, Babusar etc.

Genus:**VERPA**Swartz. ex Pers.

Ascocarp stalked, the pileus companulate, smooth, folded or wrinkled; stipe cylindrical, hollow, white. Asci cylindric, 2-, 4-, or 8-spored, not blued with Iodine.Ascospores ellipsoid, cylindric, hyaline, smooth eguttulate.Paraphyses not or slightly enlarged at the tips.

Verpabohemica, (Krombh.)Schroet (Poisonous)

Ptychoverpabohemica(Krombh) Boud.

On soil, Mahandari (Kaghan 10.05.1990, no. 7901, [5];[7]1978.Kamalban, PMNH no.35595, BPI no. 20708.

Family**: Helvellaceae**

Fruit body with a well developed stalk, cup/saddle shaped or with a lobed cup; spores smooth, with large internal gutules. It has volatiles and is highly toxic.

Genus:**GYROMITRA,** Fr.
Ascocarp terrestrial or lignicolous, stalked or irregularly lobed or cerebriform, reddish brown.Asci cylindrical, 8-spored, not bluing with iodine.Ascospores ellipsoid, hyaline, smooth, containing two oil drops.Paraphysesseptate, slightly enlarged above.
Gyromitraesculenta,(Pers.) ex Fr. Fr.,
On ground ,Shogran, [7].
Gyromitra infulva(Schaeft.:Fr. Quel.
On decaying logs, Shogran, [7].;Shogran, [20].
Genus:**HELVELLA,** L. ex St.Amans,
Ascocarp distinctly stalked or sub sessile, cupulate or saddle shaped; hymenium whitish, grayish or almost black, less often brownish; stipe and lower surface of the pileus smooth, villose. Stalk even, sulcate or chambered, hollow or olid; Asci cylindrical, 8spored, not blued with iodine. Ascosporeelloipsoid or subfusiform, hyalin smooth or minutely warted with a large median guttule.Paraphyses filiform, straight, septate the terminal cell hyaline or with colored walls.
Helvellacrispa,(Scop. Fr.
On soil, Shogran, 24.08.1989, no. 89; Kamal Ban, 24.09.1990, no. 8597.[5]; [7].
Helvellaelastica, (Bull.)Bound.
On soil Malakandi, 08.05.1990, no. 7902; [7].
Helvellalacunosa, Afz.
On soil, Naran, 25.08.1989, no. 7937.[7].
All the species of *Helvella* and allies are toxic in raw state.
Helvellavillosa(Hedw.exKze.Dissing&Nannf.
On ground, Shogran, [7].
Family:**Pyrenomycetaceae**
Fruit bodies cup shaped to ear shaped, sessile or stalked, smooth or hairy, asci not blued with iodine, spores smooth or ornamented**.**
Genus:**ALEURIA,** Sacc. &Syd.
Ascocarpterricolous, sessile, cup shaped, hymenial surface red, Ascicylindric, 8spored, not blued with iodine. Ascospores hyaline, biguttulate, warted or reticulate; paraphysis straight, septate, enlarged at the tip or not. Poisonous, lectin is extracted
Aleuriaaurantia, (Pers. Fuck.
On soil, Kamal Ban, 10.07.1989, no. 7906, Malakandi, 06.05.1990, no. 7914, 08.05.1990, no. 7859.
Genus;**HUMARIA,** Fckl. em Dennison,
Ascocarp discoid or cupulate, sessile; hymenium surface light colored, white grey or light brown.Ascicylindric, 8 spored not blued with iodine. Ascospores ellipsoid or rarely fusiform, smooth or warted.Paraphyses filiform, septate nor enlarged at the tips and lacking coloring contents. Antibacterial used with other medicinal plant.
Humariahemispherica, (Wigg. ex Gray) Fckl.,
On ground, Sharhan, [5];[7].
Humariawoolhopeia, (Cke.&Phill.Eckbl.
On Soil under *Juglanregia*, Naran, 10.07.1989, no. 7918. [7] .
Genus:**OTIDEA**(Fr. Fckl.
Ascocarp ear shaped and split down one side, sessile or subsessile, outersurface greyish or brownish. Asci cylindrical 8 spored not blued with iodine. Ascospores ellipsoidal, hyaline, smooth, biguttulate, the nuclei not staining in acetocarmine.Paraphyses strongly hooked or curved at the tips.
Otidealeporina(Batsch. ex Fr.) Fckl.
Scharhan.[4]; [5]; [7].

Genus:**TARZETTA**(Cke.) Lamb.
(PustulariaFckl.;PustulinaEckbl.)
Ascocarp usually sunken in the soil, cupulate, sessile or short stalked, brittle or fragile, outer surface smooth, villose or verrucose, the margin usually fringed with long septate, hair like hyphae. Ascospores large, elliptical, biguttulate hyaline, smooth or warted.Paraphyses slender, hyaline, occasionally lobed at the apex. The ascospore and paraphyses nuclei are stained deeply in acetocarmine (carminophilous). Mycorrhizal mushroom
Tarzettabronca(Peck.)Korf& Rogers
Scharhan, [7].
Genus:**SARCOSCYPHA**Fr.
Apothecia bright colored, the cells containing carotnoides (bright yellow, orange or red pigments), sub sessile or sub stipitate. Asci long-cylindrical, not bluing with iodine.Ascospores ellipsoid to cylindrical hyaline, smooth.multiguttulate. Paraphyses filiform, septate, the tip cells multinucleate, sometimes branching or anastamosing.
Sarcoschyphacoccinea, (Jacq.)Lamb.
On soil and wood, Shogran, 08.05.1990, no. 7867.
Sarcoschyphaoccidentalis, (Schw.) Sacc.
On soil, Sharhan, 24.08.1989, no. 7922.Malakandi 6500 ft. no. 7877, 7922.
Genus:**SCUTILLINIA, (**Cke.) Lamb.emDenniso
Ascocarpcupulate to discoid, sessile, conspicuously hairy just below the margin, hairs with a rooting, forked base, arising from the deeper layer of the flesh, stiff, thick walled, brown, septate, pointed. Ascospores ellipsoid, hyaline with bearing warts, multiguttulate.Paraphyses filiform, septate, containing coloring matter, turning green in iodine.
Scutelliniascutellata, (L.)Lamb.
On soil and deteriorating wood lying near running water or near moistened area, Kamal ban, 25.09.90, no. 8592; 10.07.1989, no. 7921; Naran, 25.08.1989, no. 7930; 10.07.1989, no.7931, 7932, 7933; Sharhan, 24.08.1989, no. 7934, Shogran, 30.08.1989, no. 1919; [6].
Family:**Pezizaceae**
Fruit body cup shaped at first, some time expanded and reflexes with age.
Genus:**PEZIZA**L. ex St.-Amans, Poisonous
Ascocarp discoid or cupulate, sessile or short stalked, hymenium brown, olive brown or purple or black never red or bright orange; Asci cylindrical, tips always blued with iodine.Ascospores ellipsoid, or fusiform, less often globose, hyaline, rarely brownish, smooth or warted or reticulate. Not edible, but medicinal as Anti-tumor
PezizabadiafuscaKorf.
Shogran, [7].
***Pezizamicropus,** Pers.
Kamal Ban, 10.07.1989, no. 7916; on rotten logs, Naran, [6]; [7]**.**
PezizarepandaPers.
On ground, Shogran, [7].

PezizathozetiiBerk.,
Humariathozetii (Berk.)Sacc.
On decaying logs, Shogran, [6].
Pezizaviolacea, Pers.
On soil, Kamal Ban, 10.07.1989, no. 7909.[7].
Pezizaplectania, Fckl.
On soil, Malakandi, 08.05.1989, no. 7885.
The fruit body of Peziza species are saucer shaped small to minute on wood and soil. It is edible in some countries but not commonly used.
Order:**TUBERALES**
Subterranean Ascomycetes (Truffles).
Genus:**TUBER,** Berk. & Br. (Edible)
Stromata superficial, globose, hemispherical or turbinate, sessile, dirty white, varying to shades of purple with age; context strikingly zonate, fibrous white or dark. Ascocarps borne in periphery of the stroma, ovate tocompressed, with punctate to umblicateostioles. Asci cylindrical, stalked, 8 - spored. Ascospores 1 celled dark brown, inequilaterally elliptical. Conidial layer borne on the ectostroma, pulverulent.Conidia hyaline to palecolored, 1cellaed, minute. It is one of the true truffle highly esteemed from the culinary point of view. Fruit body globose a sub globose, 23 cm dia., sometimes lobed. Flesh with veins. Spores with short echines. It is subterranean,mycorrhizal. Occurring throughout the rainy season in plains and hilly areas, usually around the *Quercus* tree, on ripening emit pleasant smell. On soil Shogran, 26.09.1990, no.772.
Tuber puberlam Berk.& Br. Edible
Ascospores variable in size, globose, reticulate and spiny.Edible fungi on ground, Shogran, Mansehra, [25].
Genus:**DALDINIA** Ces. & de not,
Daldiniaconcentrica, (Boet.) de Not.(Family Xylariaceae).
Fruit body hemi-spherical, sessile, dark brown then blackish, flesh dark or slaty with concentric silver zones, small perithecia beneath the external crust.Antifungal and anti bacterial for skin diseaseOn dead wood / leaves, Kamal ban, 24.09.1990, no. 8596; [5]; [7].
Daldinia veronica(Schw.) Ces.& de Not.
On stumps of deciduous trees, Naran, [7].
Genus:**LEOTIA**Pers.
Leotiaviscosa, Fr.
Scharhan, [6]; [7]**.**
Genus:**TRICHOGLOSSUM,** Boud.
Ascocarpclavate& lanceolate or spathulate blackish brown, stipitate; Asci 8 spored; Ascospores ascicular to subfusiform, straight to curved, septate brown. Paraphyses septate in the lower part, brown above and hyaline below. It is also known as earth tongue, and in folklore and in medicine.
Trichoglossumhirsutum(Pers. ex Fr. Boud.
On soil, Shogran, [7].

CONCLUSION:

It is concluded that the 3rd edition of the checklists is an additional effort to review and entirely present the accurate names of species of mushrooms asco. andGasteromycetes of Kaghan valley, at this time known in Pakistan, also to list their synonymous names occurring in the available sources on the fungi in Pakistan. We look forward to that this paper will be a guide for future studies and a helpful source for creation of a database of the Pakistani mycota. We plan to bring up to date frequently the Internet version of the checklists.

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