Diversity and Distribution of Macro Fungi in Some Selected Parks and Gardens of Dhaka City, Bangladesh

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Authors’ contributions
This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT
A survey was conducted during June to November, 2017 in five selected parks and gardens of Dhaka city, Bangladesh namely National Botanical Garden, National Zoo, Romna Park, Dhanmondi Lake and Boldha Garden. The investigation was done to analyze the morphology, diversity and distribution of macro fungi. A total of 44 macro fungi samples were collected and identified to 32 species under 18 genera and 18 families. The most frequent collected genera were Ganoderma sp., Daedeleopsis sp., Ramariopsis sp., Crepidotus sp. and Daldinia sp. The maximum frequency of identified species was exhibited by Ganoderma lucidum (9.46%), followed by Ganoderma applanatum (8.1%), Volvariella volvacea (5.41%), Agaricus bisporus (5.41%) Daedaleopsis confragosa (4.05%), Trametes versicolor (4.05%) and Ganoderma boninense (4.05%). The maximum density of occurrence among collected samples was exhibited by Ramariopsis kunzei (11.3%), Ganoderma lucidum (9.9%), Crepidotus variabilis (5.3%) and Daedaleopsis confragosa (3.76%). The predominant species found in National Botanical Garden is Ganoderma applanatum.

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in Ramna Park is *Ganoderma lucidum*, in Dhanmondi Lake is *Ramariopsis kunzei*, in Boldha Garden is *Ganoderma lucidum* and in National zoo is *Amanita bisporigera*. The collected specimens were deposited to the Sher-e-Bangla Agricultural University Herbarium of Macro Fungi (SHMF).

Keywords: Macro fungi; frequency; density; diversity; Ganoderma; Agaricus; Dhaka; Bangladesh.

1. INTRODUCTION

A macro fungus is a species whose basidiocarp is visible in naked eye. Some species of macro fungi attack dead wood and some are parasitic and colonize living trees [1]. They are still mostly the first agents of decay. The number of recognized mushroom species has been reported to be 14,000, Which is about 10% of the total estimated mushroom species on the earth [2].

Mushroom is a general term used mainly for the fruiting body of the macro fungi (Ascomycota and Basidiomycota) and represents only a short reproductive stage in their life cycle [3]. The Romance and Greeks treated mushrooms as a special kind of food [4] and there is historical evidence of mushroom consumption in ancient India [5]. Many researchers have been working on wild mushroom and reported more than 2000 species of edible mushroom all over the world [6].

Macro fungi are one of the promising concepts for crop diversification in Bangladesh as well as the whole world. The species diversity of fungi and their natural beauty occupy prime place in the biological world [7]. The scope is limitless and this is right time to survey, recording collection, identification, conservation and of the study on biodiversity, habitat and morphology of wild macro fungal specimen. As no one knows when and how some of these valuable forms might be extinct forever. The wild mushrooms are richer sources of protein and have a lower amount of fat than commercial mushroom [8]. Some mushrooms have been important source of revenue for rural communities in India and other developing countries [9]. Another study [7] provides a database on macro fungal diversity of Bangladeshi forest, along with their ecological preferences and utilization. As soil and climate situation of this region is very suitable for mushroom cultivation; Bangladesh has a huge prospect of mushroom cultivation. Through mushroom cultivation, it is possible to generate considerable employment opportunity, alleviate poverty, and reduce malnutrition to meet the required protein of Bangladesh people. Even it is possible to earn a huge amount of foreign currency by exporting mushroom after meeting the domestic demand. So this is the high time to give emphasis on commercial production of mushrooms and taking wild edible mushroom under commercial cultivation to ensure food security in Bangladesh. The Rangamati hill of Bangladesh has the important source of wild macro fungi which might be helpful to reduce the unemployment problem by identifying the edible and medicinal macro fungi as well as to improve the economic status of our farmers [10].

There are many hot spots in Dhaka, the capital city of Bangladesh where such kind of macro fungi is grown naturally. Keeping this view in mind, the research work was undertaken to collect different kinds of macro fungi from selected parks and gardens of Dhaka city and to study diversity, distribution, morphological, microscopic and ecological characteristics of collected macro fungi

2. MATERIALS AND METHODS

2.1 Survey Area

Field survey was conducted for collection of various macro fungi samples from National Botanical Garden, National Zoo, Romna Park, Dhanmondi Lake and Boldha Garden of Dhaka (Fig. 1). The collection sites were selected based on the presence of samples in the survey area. Collected sample was preserved as dried specimens in the Sher-e-Bangla Agricultural University Herbarium of Macro Fungi (SHMF).

2.2 Macro Fungi Collection

The fungal survey depends on timing and location of observation. Necessary materials and equipments such as isolation kit, slants, petridishes containing medium, isolation chamber, typed data sheet, digital camera for photography, digging equipment, heat convector card board, chemical reagents for biochemical analysis were arranged and collection of samples was made during day time and ecological characteristics of mushrooms was recorded in the data sheet.
2.3 Time of Collection

This survey was conducted during August to October, 2017. Because during this time, rainfall was abundant in Dhaka city than other seasons and maximum macro fungi grow well during this time.

2.4 Photography

The photograph was taken in their natural habitat. Each sample was wrapped with necessary information tagging as date of collection, sample no., location name and host name.

2.5 Macro Fungi Identification

The collected specimens were brought to the laboratory. The morphological parameters used for identification of macro fungi specimens were locality, habitat, type of soil, forest type, size of the basidiocarp, umbo, scale, gills, color, gill edges, gill attachment, gill spacing, stipes, length, width, shape, type of veil, annulus (position), volva, carpophores shape, cap color, cap surface, cap margin, cap diameter, and spore diameter.

2.6 Drying and Storing

Then the specimens were dried in hot air dryer at 40-50°C and stored in air tight containers with some silica gel for further microscopic studies.

2.7 Spore Analysis

Permanent glass slides were made from rehydrated basidiocarps with the aid of a sharp surgical blade for the microscopic characterization. Basidiocarps were immersed in cotton blue stain and glycerin and small tissues cut off from gill or pore was placed on glass slides and covered with cover slips. The spore

![Fig. 1. Survey areas of macro fungi in Dhaka city](image-url)
size was measured using Motic microscope with the magnification of 40 x [11]. The identification and classification was done by comparing the previously recorded characteristics of macro fungi following the color dictionary of macro fungi written by Dickinson and John [12], the macro fungi guide and identifier by Jorden [12] and the macro fungi identifier by Pegler and Spooner [13].

2.8 Diversity Analysis

A standard procedure and pre-designed data analysis procedures was used to collect the information in level of knowledge on biodiversity of macro fungi. The frequency and density of different species has been determined by the following formulas [14].

\[
\text{Frequency of fungal species} = \frac{\text{Number of sites}}{\text{Total number of species}} \\
\text{Density} = \frac{\text{Total number of individual of a particular species}}{\text{Total number of species}} \
\]

3. RESULTS

The species name, common name, basidiocarp and basidiospore morphology of collected macro fungi samples were described in tabular form (Table 1). Photographs of basidiocarps and basidiospores were presented in Plate 1 to Plate 9. Family name of identified species and their ecological location of collection, habit, frequency, density, temperature, soil type and weather of collection sites were tabulated (Table 2).

4. DISCUSSION

Trametes versicolor was found in Romna Park, Boldha Garden and in National Zoo in association with Swietenia macrophylla (Mehogoni) with a frequency and density of 4.05% and 2.26%, respectively. In another study [15] it has been found on dead logs of Cocos nucifera (Coconut) tree with 25% frequency and 4.55% density in mangrove forest regions of Bangladesh. This species was previously found associated with Albizia lebbeck tree with 22.22% frequency and 13.89% density [10]. Albizia procera (Royal siris) tree was also described as a host of Trametes versicolor previously from tropical moist deciduous forest region of Bangladesh [16]. Trametes versicolor was also reported from Bangalore (Karnataka) of India and found medicinal importance [17]. This genus has a widespread distribution and contains fifty species [18] and reported from India also [19]. Two species of Daedaleopsis namely Daedaleopsis versicolor and Daedaleopsis tricolor were found in National Botanical Garden, Dhanmondi Lake and in National Zoo. Daedaleopsis sp. was also reported in Pakistan [20]. Daedaleopsis confragosa was recorded in association with Albizia procera (Koroi). In another study [21] this species was identified on wood of Acacia auriculiformis (Golden shower) with 5% density. The frequency and density of Daedaleopsis confragosa was found with highest frequency of 75% in Mangrove forest regions of Bangladesh [15]. Daedaleopsis tricolor was previously collected from bark wood of Leucaena leucocephala (Ipil-ipil) and Acacia auriculiformis (Golden shower) tree [16]. In the present study, frequency and density of Daedaleopsis tricolor were 2.70% and 3.11%, respectively. Daedaleopsis sp. is widely distributed genus containing six species [18]. This species was also reported in tropical moist deciduous forest of Bangladesh [22]. This genus was first reported from Europe in 1791 [18].

Daldinia concentrica was found in National Botanical Garden and in National Zoo on dead bark wood of Acacia auriculiformis (Golden shower). Daldinia concentrica was previously reported from Babugonj of Barisal district in southern region of Bangladesh with a frequency and the density of 6.25% and 18.60%, respectively. But this species was recorded in association with Swietenia macrophylla (Mehogoni) tree in southern region of Bangladesh with 6.25% frequency and 18.60% density [23]. In another study, this species was found on dead logs of Swietenia macrophylla (Mehogoni) [15]. The species was also found in Navsari, south Gujarat, India [24]. In present study, the recorded frequency and density of its presence were 2.7% and 2.25%, respectively.

Tuber aestivum was found in Romna Park and Boldha Garden in association with Dahlia sp. (Dahlia) plant which was supported by previous study [16,22]. This species was found in associated with Swietenia macrophylla (Mehogoni) [23]. The frequency and density of collected species were 2.70% and 1.5%, respectively. Tuber sp., Volvariella sp., are widely distributed [18] whereas, Tuber sp. was found in almost all European countries [25].
| Sl. No. | Species name | Common name | Basidiocarp Characterization | Spore |
|--------|--------------|-------------|-----------------------------|-------|
| 1      | Trametes versicolor | Turkey tail | Texture of the fruiting body was woody. Pileus was convex and umbranolate shaped, creamy brown in color with no scale. Size of the basidiocarp was 7.4×4.3 cm. The surface character and zonation was corky and dry in nature. Margin semi-round shaped and stipe was absent. Hymenophore beneath the cap was absent. | Yellowish brown in color, thick walled, smooth, oval and size of spores was 5.1×3.4 µm. |
| 2      | Daedaleopsis confragosa | Blushing bracket | Texture of the fruiting body was tough and woody. Pileus was concave shaped, brown in color with yellow margin. Size of the basidiocarp was 15.4×9.4 cm. The surface character and zonation was woody and dry in nature. Margin wavy round shaped and stipe was absent. Pore color was yellow. Hymenophore beneath the cap was absent. | Light brown in color, thick walled, smooth, irregular, elongated and size of spores was 5.3×4.2 µm. |
| 3      | Daedaleopsis concolor | Blushing bracket | Texture of the fruiting body was tough, hardy. Pileus was flat shaped, deep brown in color with yellow border. Size of the basidiocarp was 12.2×6.6 cm. The surface character and zonation was leathery and dry in nature. Hymenophore beneath the cap was absent. Margin wavy round shaped and stipe was absent. Flesh color was pleasant. | Hyaline to light brown in color, thick walled, smooth and round in shape and size of spores was 4.8×4.1 µm. |
| 4      | Tubaria aestivina | Truffle | Texture of the fruiting body was hardy. Pileus was irregular shaped and irregular shaped, brownish white in color with no scale. Size of the basidiocarp was 3.2×2.6 cm. The surface character and zonation was dry and glabrous in nature. Margin irregular shaped and stipe was absent. | Brown in color, thick walled, smooth, round and size of spores was 6.2×4.4 µm. |
| 5      | Ganoderma lucidum | Lingzhi or reishi mushroom | Texture of the fruiting body was leathery and woody. Pileus was depressed shaped, lower part brick red with white top in color. Size of the basidiocarp was 3.8×2.4 cm. The surface character and zonation was rough and dry in nature. Margin incurved shaped and stipe was absent. Spore bearing surface under cap was pore, pore color was brown. | Hyaline to light brown in color, thin walled, smooth, slightly ellipsoidal and size of spores was 7.3×4.9 µm. |
| 6      | Ganoderma tsugae | Hemlock varnish sell | Texture of the fruiting body was tough and woody. Pileus was depressed, curved shaped, black in color. Size of the basidiocarp was 3.8×2.4 cm. The surface character and zonation was hardy and dry in nature. Margin incurved shaped and stipe was absent which was chokolate in color, in central position. Pore color was white. Flesh odor was pleasant. | Yellowish brown in color, thin walled, smooth, slightly ellipsoidal and size of spores was 6.3×4.9 µm. |
| 7      | Ganoderma pleffien | Lingzhi or reishi mushroom | Texture of the fruiting body was woody and tough. Pileus was flat shaped, corky in color with very thin white line at margin. Size of the basidiocarp was 8.1×6.4 cm. The surface character and zonation was rough and dry in nature. Margin incurved shaped and stipe was absent. Spore bearing surface under cap was pore, pore color was light brown. | Blackish brown in color, thick walled, smooth, unicolour, slightly elongated and size of spores was 5.2×4.8 µm. |
| 8      | Ganoderma zonatum | Lingzhi or reishi mushroom | Texture of the fruiting body was corky, tough and hardy. Pileus was umbilicate shaped, milky white to creamy in color. Size of the basidiocarp was 3.4×3.3 cm. The surface character and zonation was woody and dry in nature. Margin incurved shaped, convex and stipe was absent. Spore bearing surface under cap was brown colored. Pore spacing was crowded. | Blackish brown in color, thick walled, smooth, unicolour, slightly elongated and size of spores was 5.2×4.8 µm. |
| 9      | Ganoderma applanatum | Lingzhi or reishi mushroom | Texture of the fruiting body was corky, tough and hardy. Pileus was irregularly raised, flat shaped, purplish color. Size of the basidiocarp was 14.5×8.4 cm. The surface character and zonation was dry and weakly wavy in nature. Margin wavy shaped and stipe was absent. Spore bearing surface under cap was pore. Pore color was whitish, brown when aged. Pore spacing was moderately crowded. | Blackish brown in color, thick walled, rough, ellipsoidal and size of spores was 6.2×4.8 µm. |
| 10     | Ganoderma spatulatum | Lingzhi or reishi mushroom | Texture of the fruiting body was corky, tough and hardy. Pileus was flat shaped, reddish brown in color. Size of the basidiocarp was 4.6×6.5 cm. The surface character and zonation was crackling and dry in nature. Margin wavy shaped and stipe was absent. | Orange brown in color, thick walled, smooth, ellipsoidal and size of spores was 5.3×6.2 µm. |
| 11     | Ganoderma sp. | Lingzhi or reishi mushroom | Texture of the fruiting body was corky, tough and woody. Pileus was umbilicate shaped, brownish black in color. Size of the basidiocarp was 6.5×4.3 cm. The surface character and zonation was tough and dry in nature. Margin wavy, incurved shaped and stipe was absent. Spore bearing surface under cap waspora. Pore color was dirty black. Pore spacing was crowded. | Brown in color, thick walled, smooth, slightly cylindrical and size of spores was 5.2×4.8 µm. |
| 12     | Ganoderma sp. | Lingzhi or reishi mushroom | Texture of the fruiting body was corky, tough and woody. Pileus was umbilicate shaped, milky white to creamy in color. Size of the basidiocarp was 6.4×5.2 cm. The surface character and zonation was hardy and dry in nature. Margin irregularly curved and stipe was absent. Spore bearing surface under cap was pore which was brown. | Hyaline to light brown in color, small, thick walled, smooth, rounded and size of spores was 5.2×4.8 µm. |
| 13     | Namanopsis kunzei | White coral | Texture of the fruiting body was spongy. Pileus was bushy shaped, white in color. Size of the basidiocarp was 5.5×2.5 cm. The surface character and zonation was fibrous and slightly moist in nature. Margin imbricate/cork shaped and stipe was present. Size of stipe was 2.5×0.9 cm. Dirty white stipe was solid, in central position. | Light brown in color, thin walled, smooth, rounded and size of spores was 2.6×4.3 µm. |
| 14     | Hypholoma fasciculare | Clusstered woodlover | Texture of the fruiting body was spongy, soft. Pileus was umbilicate shaped, white in color. Size of the basidiocarp was 0.6×0.7 cm. The surface character and zonation was glabrous and moist in nature. Margin incurved shaped and stipe was present. Stipe color was white. Size of stipe was 3.2×0.9 cm. Stipe firmness was narrow and tubular. Convex well shaped umbo present. Spore bearing surface under cap was white colored gills. | Light brown in color, thick walled, smooth, rounded to slightly elongated and size of spores was 7.7×5.2 µm. |
| 15     | Hypholoma sanguineus | Bracket fungus | Texture of the fruiting body was soft, spongy. Pileus was concave shaped, dark orange in color. Size of the basidiocarp was 3.1×1.2 cm. The surface character and zonation was soft and moist in nature. Margin smooth round shaped and stipe was absent. Pseudostem present under the cap. | Reddish brown in color, thick walled, smooth, slightly elongated and size of spores was 5.3×4.2 µm. |
| 16     | Volvannaria volvaeca | Paddy straw | Texture of the fruiting body was soft. Pileus was convex shaped, white in color. Size of the basidiocarp was 4.2×4.3 cm. The surface character and zonation was fibrous, leathery and moist in nature. Margin dentate and stipe was present. White colored stipe was soft, in central position. Volva was present. Spore bearing surface under cap was gills. Creamy white colored gilled gills were present. | Brown in color, thick walled, smooth, slightly elongated and size of spores was 7.2×3.7 µm. |
| 17     | Gymnopilus purpuratus | Little angel mushroom | Texture of the fruiting body was soft. Pileus was concave shaped, white in color. Size of the basidiocarp was 0.9×0.8 cm. The surface character and zonation was soft, moist and smooth in nature. Margin was slightly dentate, incurved shaped and stipe was present. Size of stipe was 2.9×0.8 cm. White colored, narrow and tubular stipe was in central position. Convex, well shaped umbo was present. Spore bearing surface under cap was narrow, white colored, closed gills. Forking pattern was unbranched. | Brown in color, thin walled, small, rounded and size of spores was 3.4×2.3 µm. |
| 18     | Dalmaea punctocarnea | Cram balls | Texture of the fruiting body was tough, hard and woody. Pileus was convex shaped, dirty pink in color. Size of the basidiocarp was 4.6×1.9 cm. The surface character and zonation was smooth and dry in nature. Margin smooth and entered shaped and stipe was absent. | Dark brown in color, thick walled, smooth, ellipsoidal and size of spores was 5.7×3.4 µm. |

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| Sl. No. | Species name          | Common name                  | Basidiocarp | Characterization | spore                        |
|--------|-----------------------|------------------------------|-------------|------------------|------------------------------|
| 20     | Ganoderma boninense   | Lingzhi or reishi mushroom   | B D F       | Texture of the fruiting body was tough and very hardy. Pileus was concave shaped, deep pink in color with white border. Size of the basidiocarp was 4.3×2.9 cm. The surface character and zonation was woody and dry in nature. Margin round shaped and stipe was present which was chocalaty in color, in central position | Brown in color, thick walled, smooth, elipsoidal and size of spores was 8.4×5.7 µm. |
| 21     | Ganoderma tenuae      | Lingzhi or reishi mushroom   | B D F       | Texture of the fruiting body was tough, woody. Pileus was umbonate and irregular shaped, whitish brown in color. Size of the basidiocarp was 8.6×4.4 cm. The surface character and zonation was irregular, rough and dry in nature. Margin very irregular shaped and stipe was absent. Spore bearing surface under cap was ridge. | Brown in color, thick walled, smooth, elipsoidal and size of spores was 5.2×3.1 µm. |
| 22     | Ganoderma applanatum  | Lingzhi or reishi mushroom   | B D F       | Texture of the fruiting body was brittle, woody. Pileus was flat infundibuliform shaped, reddish brown with white border. Size of the basidiocarp was 15.3×9.3 cm. The surface character and zonation was cracking and dry in nature. Margin irregular curved shaped and stipe was absent. Flesh odor was agreeable. | Hyaline to light brown in color, unicellular, thick walled, smooth, slightly elongated and size of spores was 4.2×3.1 µm. |
| 23     | Ganoderma resinaceum  | Lingzhi or reishi mushroom   | B D F       | Texture of the fruiting body was spongy, leathery and woody. Pileus was slightly depressed shaped, velvety with white border in color. Size of the basidiocarp was 10.3×7.4 cm. The surface character and zonation was smooth, leathery and moist in nature. Margin incurred shaped and stipe was absent. Spore bearing surface under cap was pore on hymenium. | Light brown in color, thin walled, rough, elipsoidal and size of spores was 12.6×10.2 µm. |
| 24     | Agaricus bisporus      | Bullion mushroom             | B           | Texture of the fruiting body was spongy. Pileus was concave shaped, white in color. Size of the basidiocarp was 6×6×0.7 cm. The surface character and zonation was gelobrous, smooth and moist in nature. Margin incurred shaped and stipe was present. Size of stipe was 1.2×0.9 cm. Stipe color was dirty white. Stipe firmness was difficult. Margin was incurved, slightly dentate shaped and stipe was present. Size of stipe was 0.8×0.6 cm. Spore bearing surface under cap was pore on hymenium. | Hyaline, thick walled, smooth, slightly elongated and size of spores was 7.7×5.2 µm. |
| 25     | Coprinus variabilis    | Variable oysterling          | B           | Texture of the fruiting body was soft, fibrous and fibrous. Pileus was convex shaped, creamy white in color. Size of the basidiocarp was 2.7×2.2 cm. The surface character and zonation was scally and moist in nature. Margin dentate, incurred shaped and stipe was absent. Spore bearing surface under cap was pore on hymenium. | Brown in color, thick walled, rough, ovoid to cylindrical and size of spores was 9.8×7.8 µm. |
| 26     | Lepiota albodisca      | Shaggy parasol               | B           | Texture of the fruiting body was spongy. Pileus was concave, sunken, umbonate shaped, white in color. Size of the basidiocarp was 1.3×1.2 cm. The surface character and zonation was cracking and moist in nature. Margin incurred, slightly dentate and stipe was present. Size of stipe was 0.9×0.6 cm. Narrow, tubular white stipe was in central position. Veil was present. Convex well shaped umbo was present. Narrow white colored closed gills were present. Gill attachment was emerginate. Forking pattern was unbranched. | Dark brown in color, thick walled, smooth, elongated, unicellular and size of spores was 7.4×5.3 µm. |
| 27     | Schizophyllum commune  | Pasi                         | B           | Texture of the fruiting body was spongy. Pileus was convex shaped, creamy white in color. Size of the basidiocarp was 3.2×1.8 cm. The surface character and zonation was leathery and fibrousle in nature. Margin wavy, incurred shaped and stipe was absent. Light brown colored closed gills were present. Gill attachment was sub decurrent. Veil was present. Convex well shaped umbo was present. | Dark brown in color, thick walled, smooth, elipsoidal and size of spores was 4.5×4.3 µm. |
| 28     | Diclyphora indusiiata  | Bamboo fungus                | B           | Texture of the fruiting body was soft. Pileus was flat, round shaped, violat in color. Size of the basidiocarp was 1.9×1.6 cm. The surface character and zonation was smooth, glabrous and moist in nature. Margin was incurred shaped and stipe was present. Violate colored, tubular and narrow stipe was equal and in is in central position. Veil was present, convex, well shaped umbo was present. Spore bearing surface under cap was vieolate colored pore. | Brown in color, thin walled, smooth, elongated and size of spores was 7.2×5.4 µm. |
| 29     | Pleurotus porrigens    | Angel wing                   | B           | Texture of the fruiting body was leathery, brittle. Pileus was flat, wavy, curve shaped, white in color. Size of the basidiocarp was 4.2×3.8 cm. The surface character and zonation was leathery and dry in nature. Margin incurred shaped and stipe was absent. Umbo was present. Spore bearing surface under cap was white colored pore. | Reddish brown in color, thin walled, smooth, elipsoidal and size of spores was 6.2×4.4 µm. |
| 30     | Marasmas oreades      | Creamy flower                | B           | Texture of the fruiting body was soft, spongy. Pileus was suncane shaped, creamy yellow in color. Size of the basidiocarp was 3.5×2.4 cm. The surface character and zonation was smooth, leathery. Margin was wavy round shaped and stipe was present. Size of stipe was 0.9×0.2 cm. Spore bearing surface under cap was ridge. Rige color was yellow. | Hyaline to very light brown in color, thick walled, smooth, oval and size of spores was 6.2×5.1 µm. |
| 31     | Amanita bioporongera   | Destroying angel             | B           | Texture of the fruiting body was soft. Pileus was umbonate shaped, dirty to creamy white in color. Size of the basidiocarp was 1.4×1.2 cm. The surface character and zonation was smooth and moist in nature. Margin dentate, round shaped and stipe was present. Size of stipe was 2.6×0.3 cm. Lamellae and gill were present. Gill spacing was crowded. Gill attachment was adnexed. Gill color was brown. Veil was present. | Yellowish brown in color, thick walled, smooth, cylindrical and size of spores was 4.5×3.7 µm. |
| Name                  | Basidiocarp | Spore bearing surface under cap | Spores (100×) |
|-----------------------|-------------|----------------------------------|---------------|
| *Trametes versicolor* |            |                                  |               |
| *Daedaleopsis confragosa* |           |                                  |               |
| *Daedaleopsis confragosa var. tricolor* |       |                                  |               |
| *Tuber aestivum*      |            |                                  |               |

Plate 1. Specimen collected from selected areas

| Name                  | Basidiocarp | Spore bearing surface under cap | Spores (100×) |
|-----------------------|-------------|----------------------------------|---------------|
| *Ganoderma lucidum*   |            |                                  |               |
Plate 2. Specimen collected from selected areas

| Name               | Basidiocarp | Spore bearing surface under cap | Spores(100×) |
|--------------------|-------------|---------------------------------|--------------|
| Ganoderma lucidum  |             |                                 |              |
| Ganoderma tsugae   |             |                                 |              |
| Ganoderma pfeifferi|             |                                 |              |
| Ganoderma lipsiense|             |                                 |              |
| Ganodermazonatum   |             |                                 |              |

Ganoderma lucidum

Ganoderma tsugae

Ganoderma pfeifferi

Ganoderma lipsiense

Ganodermazonatum
Plate 3. Specimen collected from selected areas

| Name                | Basidiocarp | Spore bearing surface under cap | Spores (100×) |
|---------------------|-------------|---------------------------------|---------------|
| Ganoderma applanatum|             |                                 |               |
| Ramariopsis kunzei  |             |                                 |               |
### Plate 4. Specimen collected from selected areas

| Name              | Basidiocarp | Spore bearing surface under cap/Gill | Spores(100×) |
|-------------------|-------------|-------------------------------------|--------------|
| *Hypholoma fasciculare* | ![Basidiocarp](image1) | ![Surface](image2) | ![Spores](image3) |
| *Pycnoporus sanguineus* | ![Basidiocarp](image4) | ![Surface](image5) | ![Spores](image6) |
| *Volvariellavolvacea* | ![Basidiocarp](image7) | ![Surface](image8) | ![Spores](image9) |
| *Gymnopilus purpuratus* | ![Basidiocarp](image10) | ![Surface](image11) | ![Spores](image12) |

### Plate 5. Specimen collected from selected areas

| Name               | Basidiocarp | Spore(100×) |
|--------------------|-------------|-------------|
| *Daldinia concentrica* | ![Basidiocarp](image13) | ![Spore](image14) |
Ganoderma boninense

Ganoderma tsugae

Ganoderma applanatum

Plate 6. Specimen collected from selected areas

| Name                | Basidiocarp | Spores(100x) |
|---------------------|-------------|--------------|
| Ganoderma resinaceum|             |              |
| Agaricus bisporus    |             |              |
| Name                        | Basidiocarp | Spores(100×) |
|-----------------------------|-------------|--------------|
| Crepidotus variabilis       |             |              |
| Lepiota atrodisca           |             |              |

**Plate 7. Specimen collected from selected areas**

- **Schizophyllum commune**
- **Dictyophora indusiata**
- **Pleurotus porigens**

**Plate 8. Specimen collected from selected areas**
Table 2. Family name and ecological characterization of collected macro fungi from different parks and gardens of Dhaka city

| Sl. No | Species name | Family name | Host | location | Habit | Frequency (%) | Density (%) | Temp. (°C) | Soil | Weather conditions |
|-------|--------------|-------------|------|----------|-------|---------------|-------------|------------|------|-------------------|
| 1     | *Trametes versicolor* | Polyporaceae | *Swietenia macrophylla* | Romna Park, Boldha Garden, National Zoo | Scattered | 4.05 | 2.26 | 26 | Clay loam | Moderately moist |
| 2     | *Daedaleopsis confragosa* | Polyporaceae | *Albizia richardiana* | National Botanical Garden, Dhanmondi Lake, National Zoo | Caespitose cluster | 4.05 | 3.76 | 25 | Clay loam | Moderately moist |
| 3     | *Daedaleopsis tricolor* | Polyporaceae | *Leucaena leucocephala* | National Botanical Garden, National Zoo | Scattered | 2.70 | 3.1 | 28 | Loam | More moist |
| 4     | *Tuber aestivum* | Tuberaceae | *Dahlia* | National Botanical Garden, National Zoo | Solitary | 2.70 | 1.5 | 26 | Loam | Less moist |
| 5     | *Ganoderma lucidum* | Ganodermataceae | *Dalbergia sissoo, Azadirecta indica* | National Botanical Garden, Romna Park, Dhanmondi Lake, Boldha garden and in National Zoo | Scattered | 6.76, 2.7 | 6.77, 3.1 | 27 | Loam, clay loam | Moderately moist |
| 6     | *Ganoderma tsugae* | Ganodermataceae | *Swietenia macrophylla* | National Botanical Garden, Romna Park, Dhanmondi Lake and in National Zoo | Solitary | 4.05 | 4.5 | 25 | Loam | Moderately moist |
| 7     | *Ganoderma pfeifferi* | Ganodermataceae | *Dalbergia sissoo* | National Botanical Garden and in Solitary Romna Park | | 2.70 | 2.25 | 26 | Clay loam | Less moist |
| 8     | *Ganoderma lipsiensis* | Ganodermataceae | *Azadirecta indica* | National Botanical Garden and in Scattered Romna Park | | 2.70 | 1.5 | 26 | Sandy loam | Moderately moist |
| 9     | *Ganoderma zonatum* | Ganodermataceae | *Azadirecta indica* | National Botanical Garden and in Scattered Romna Park | | 4.05 | 3.1 | 27 | Clay loam | Moderately moist |
| 10    | *Ganoderma applanatum* | Ganodermataceae | *Acacia auriculiformis* | National Botanical Garden, Romna Park and in National Zoo | Scattered | 4.05 | 3.76 | 26 | Loam | Moderately moist |
| 11    | *Ganoderma applanatum* | Ganodermataceae | *Leucaena leucocephala* | National Botanical Garden, Dhanmondi Lake and in National Zoo | Scattered | 2.70 | 2.26 | 26 | Sandy loam | Moist |
| 12    | *Ganoderma sp.* | Ganodermataceae | *Azadirecta indica* | Romna Park and in National Zoo | Solitary | 1.35 | 0.76 | 25 | Clay loam | Moderately moist |
| 13    | *Ganoderma sp.* | Ganodermataceae | *Azadirecta indica* | National Botanical Garden, Romna Park and in National Zoo | Solitary | 2.70 | 2.25 | 25 | Clay loam | Moist |
| 14    | *Ramariopsis kunzei* | Clavariaceae | On soil | Dhanmondi lake | Solitary | 2.70 | 11.28 | 27 | Loam | Moist |
| 15    | *Hypholoma fasciculare* | Strophariaceae | *Ficus benghalensis* | National Botanical Garden and in National Zoo | Scattered | 2.70 | 1.5 | 26 | Loam | Moist |
| Sl. No. | Species name            | Family name     | Host name                  | Host location                                                                 | Habit        | Frequency (%) | Density (%) | Temp. (°C) | Soil          | Weather conditions       |
|--------|-------------------------|-----------------|----------------------------|------------------------------------------------------------------------------|--------------|---------------|-------------|------------|----------------|--------------------------|
| 16     | Pycnoporus sanguineus   | Polyporaceae    | Swietenia macrophylla     | National Zoo                                                                 | Scattered    | 1.35          | 1.5         | 26         | Clay loam     | Moderately moist          |
| 17     | Volvariella volvacea    | Plutaceae       | On humus                  | National Botanical Garden, Romna Park, Dhanmondi Lake and in National Zoo    | Solitary     | 5.41          | 4.5         | 25         | Loam          | Moist                    |
| 18     | Gymnopilus purpuratus   | Strophariaceae  | On humus                  | National Zoo                                                                 | Solitary     | 1.35          | 0.76        | 26         | Loam          | Moderately moist          |
| 19     | Dalpinia concentrica    | Xylariaceae     | Acacia auriculiformis     | National Botanical Garden, National Zoo                                      | Scattered    | 2.70          | 2.25        | 25         | Clay loam     | Less moist               |
| 20     | Ganoderma boninense     | Ganodermataceae | Mangifera indica          | National Botanical Garden, National Zoo                                      | Scattered    | 4.05          | 1.5         | 26         | Clay loam     | Less moist               |
| 21     | Ganoderma tsugae        | Ganodermataceae | Dalbergia sisso           | National Botanical Garden, Romna Park and in National Zoo                    | Solitary     | 1.35          | 0.76        | 26         | Loam          | Less moist               |
| 22     | Ganoderma applanatum    | Ganodermataceae | Acacia nilotica           | National Botanical Garden and in National Zoo                                | Scattered    | 1.35          | 1.5         | 25         | Loam          | Moist                    |
| 23     | Ganoderma resinaceum    | Ganodermataceae | Acacia auriculiformis     | National Botanical Garden, Romna Park and in National Zoo                    | Scattered    | 4.05          | 3.76        | 27         | Clay loam     | Moderately moist          |
| 24     | Agaricus bisporus       | Agaricaceae     | Ficus benghalensis        | National Botanical Garden, Dhanmondi Lake, Boldha Garden and in National Zoo | Scattered    | 5.41          | 4.5         | 26         | Loam          | Moderately moist          |
| 25     | Crepidotus variabilis   | Crepidotaceae   | Cocos nucifera            | National Botanical Garden and in National Zoo                                | Caespitose   | 2.70          | 5.26        | 27         | Loam          | Moderately moist          |
| 26     | Lepiota atrodisca       | Agaricaceae     | Azadiracta indica         | Boldha Garden                                                                | Caespitose    | 1.35          | 0.76        | 25         | Loam          | Moist                    |
| 27     | Schizophyllum commune   | Schizophyllaceae | Ficus benghalensis        | Romna Park and in National Zoo                                               | Scattered    | 2.70          | 2.25        | 26         | Sandy loam    | Moderately moist          |
| 28     | Dictyophora indusiata   | Phallaceae      | Bambosa vulgaris          | Boldha Garden and in National Zoo                                            | Scattered    | 2.70          | 2.25        | 27         | Loam          | More moist               |
| 29     | Pleurotus porrigens     | Marasmiaceae    | Bambosa vulgaris          | National Botanical Garden and in Dhanmondi Lake                              | Solitary     | 2.70          | 2.25        | 25         | Loam          | More moist               |
| 30     | Marasmius oredes        | Marasmiaceae    | On soil surface           | National Botanical Garden, Boldha Garden                                     | Scattered    | 2.70          | 2.25        | 27         | Clay loam     | Moist                    |
| 31     | Amanita bisporigera     | Amanitaceae     | On debris                 | National Botanical Garden and in National Zoo                                | Solitary     | 2.70          | 5.26        | 26         | Loam          | Moderately moist          |
### Plate 9. Specimen collected from selected areas

| Name                  | Basidiocarp | Spores(100×) |
|-----------------------|-------------|--------------|
| *M. oreades*          | ![Image](image1.png) | ![Image](image2.png) |
| *A. bisporigera*      | ![Image](image3.png) | ![Image](image4.png) |

*Ganoderma lucidum* was found in every survey area associated with *Azadirachta indica* (Neem). *Ganoderma lucidum* was recorded in association with *Albizia procera* (Kori) and *Dalbergia sissoo* (Sissoo) [26,21]. Six species of *Ganoderma* was recorded namely *G. lucidum*, *G. boninense*, *G. tsugae*, *G. zonatum*, *G. applanatum* and *G. resinaceum* from tropical moist deciduous forest region of Bangladesh in association with *Leucaena leucocephala*, *Bambusa vulgaris*, *Acacia auriculiformis*, *Swietenia mahagoni*, *Acacia auriculiformis* and *Acacia auriculiformis* tree, respectively [22]. The species was reported from Rajshahi, Pabna, Jipurhat and Dhaka district of the tropical moist deciduous forest region in Bangladesh. In another study [10], *Ganoderma lucidum* was found in association with *Tectona grandis* (Shegun) tree in Kaptai, Rangamati of Chittagong Hill tracts under tropical evergreen and semi-evergreen forest of Bangladesh. The species was found in association with *Leucaena leucocephala* (Ipil-Ipil) and *Acacia auriculiformis* (Golden shower) under tropical moist deciduous forest region of Bangladesh [22]. Another study found this species from Chittagong Hill tracts with a frequency and density of 11.11% and 2.78%, respectively [10]. But the species was also described from Bogra district under social forest region of Bangladesh with a frequency and density of 75% and 25%, respectively [16]. Another survey found this species from National botanical garden, Dhaka, Bangladesh with a density of 25% [21]. The difference in frequency and density of the species might be due to the difference in geographic area of the collection sites. In present study, the frequency and density of its presence were 6.76% and 6.77%, respectively.

*Ganoderma boninense* was found in National Botanical Garden in association with *Mangifera indica* (Mango) tree [21]. *Ganoderma boninense* was also recorded in association with *Dalbergia sissoo* (Sissoo) tree with frequency of 75% and density of 43.5% in social forest region of Bangladesh [16]. This species also found associated with *Bambusa sp.* [22]. In present study, the frequency and density of its presence were 4.05% and 1.5%, respectively.

*Ganoderma tsugae* was found in National Botanical Garden, Romna Park, Dhanmondi Lake and in National Zoo associated with *Swietenia macrophylla* (Mehogani) tree and *Dalbergia sissoo* (Sissoo) which was previously reported by many scientists [16,21]. But this species was also found in association with *Acacia auriculiformis* (Golden shower) under tropical moist deciduous forest region of Bangladesh [22]. In present study, the frequency and density of it's presence were 1.35-4.05%.
and 0.76-4.5%, respectively. Previously this species was described with the density of 12.5% and 10% under social forest region of Bogra and national botanical garden, respectively [16,21].

_Ganoderma pfeifferi_ was found in National Botanical Garden and in Romna Park collected from the bark wood of _Dalbergia sissoo_ (Sissoo). This species was also recorded from wood of _Acacia auriculiformis_ (Golden shower) in national botanical garden of Bangladesh [21]. In the present study, the recorded frequency of this species was 2.70% and density was 2.25% where in another survey, the density was recorded 35% [21]. In another study, _Ganoderma lipsiense_ was found in National Botanical Garden, Dhaka in association with _Azadiracta indica_ (Neem) [21]. In present study, the frequency and density of its presence were 2.70% and 1.5%, respectively. Density of this species was previously recorded as 5% [21].

_Ganoderma zonatum_ was found in National Botanical Garden, Romna Park and in National Zoo in association with _Azadiracta indica_ (Neem). _Swietenia mahogani_ (Mehagani) [22] and _Dalbergia sissoo_ (Sissoo) [26] were previously reported as the host of this species. In present study, the frequency of this species was recorded as 4.05% and density 3.1% whereas in another survey its frequency and density was recorded as 25% and 18.75%, respectively [26].

_Ganoderma aplanatum_ was found in National Botanical Garden, Dhanmondi Lake and in National Zoo in association with _Azadiracta indica_ (Neem). In another study three species were collected during the investigation, viz._Ganoderma aplanatum, Ganoderma tsugae_ and _Ganoderma lucidum_ on the bark of tree and on dead plant [20]. But the species was previously reported on _Acacia auriculiformi_ [22,27] and _Swietenia mahagani_ (Mehogani) [15] and on _Dalbergia sissoo_ [26]. In present study, the frequency of its presence was 1.35-4.05% and density was 1.5-3.76%.

_Ganoderma resinaceum_ was found in National Botanical Garden, Romna Park, and in National Zoo in association with _Acacia auriculiformis_ (Golden shower). This species was previously found on _Dalbergia sissoo_ (Sissoo) [26]. In present study, its frequency was 4.05% and density was 3.76%.

_Ganoderma sp._ was found in Romna Park and in National Zoo in association with _Azadiracta indica_ (Neem) with a frequency and density of 1.35-2.70% and 0.76-2.25%, respectively. This species was found with the bark of _Dalbergia sissoo_ (Sissoo) under social forest region of Bangladesh [26]. Recently several species of _Ganoderma_ was reported from tropical evergreen and semi-evergreen forest regions under Sylhet and Moulovibazar districts of Bangladesh [28]. Another study found this species on root of _Terminalia bellirica_ (Bohera) [21].

_Ganoderma sp._ was found in National Botanical Garden, Romna Park, and in National Zoo in association with _Azadiracta indica_ (Neem). Taxonomy and diversity of _Ganoderma lipsiense_ and _Ganoderma aplanatum_ was also reported in India [27]. It was also reported in China [29] and in India [30,19,31]. In present study, the recorded frequency and density of its presence were 1.35-2.7% and 0.76-2.25%, respectively.

In the present study _Agaricus bisporus_ was recorded in National Botanical Garden, Dhanmondi Lake, Boldha Garden and in National Zoo in association with dead bark wood of _Ficus benghalensis_ (Banyan) tree though _Agaricus silvicola_ was previously found on _Cocos nucifera_ (Coconut) tree in Daulatpur, Kushia of south western region of Bangladesh with a frequency and the density of 12.5% and 2.70%, respectively [32]. Three species of _Agaricus_ namely _Agaricus silvicola, Agaricus campestris_ and _Agaricus arvensis_ were described also [32]. _Agaricus campestris_ was found in Sadar Upazila, Jessore district with a frequency and the density of 12.5% and 2.70%, respectively associated with _Borassus flabellifer_ tree. _Agaricus campestris_ was previously found on root zone of _Dalbergia sissoo_ (Sissoo) in southern region of Bangladesh [23] though _Agaricus arvensis_ was found in Daulatpur, Kushia district with a frequency and the density of 12.5% and 5.40%, respectively. The genus _Agaricus_ was also reported from India [33, 19]. In another study, a total nine number of _Agaricus_ mushrooms were collected and described during survey [27]. _Agaricus_ sp. was found in Modhupur, Dhaka, Dashmina and Pathorghata, Bangladesh also. The frequency of its presence was 22.22% and the density was 40%. The mushroom was found on the root zone of _Leucaena leucocephala_ (Ipil-ipil). Soil moisture was 6.5, soil PH was 7.0 and soil type was sandy loam. Average temperature was recorded 30 degree Celsius during collection. In present study, the frequency of _Agaricus bisporus_ was 5.41% and density was
4.5%. Occurrence of different macro fungal species and their differential frequency and density of occurrence in different location of collection is might be due to the climatic impact on macro fungal community structure [34].

Ramariopsis kunzei was found only in Dhanmondi lake on soil though this species was previously found in association with Leucaena leucocephala (Ipl-Ipl) and Acacia auriculiformis (Golden shower) under tropical moist deciduous forest region of Bangladesh [27]. This genus has a widespread distribution and contains 44 species [18]. Two species of this genus were reported in Western Ghats, Kerala, India [33]. Ramariopsis kunzei was also reported in Northeast Ohio [35]. Ramariopsis sp. was found in Dhaka district of the tropical moist deciduous forest region in Bangladesh [22]. In present study, the recorded frequency and density were 2.70% and 11.28%, respectively.

Hypholoma fasciculare was identified in National Botanical Garden and in National Zoo in association with Ficus benghalensis (Banyan) tree. Another study [23] found this species on Swietenia macrophylla (Mehogani) tree in southern region of Bangladesh. Other investigation [32] found this species on root of Cocos nucifera (Coconut) tree under south western region of Bangladesh. They also described that Hypholoma fasciculare and Hypholoma capnoides were found in Shyamnagar of Satkhira district in an association with Cocos nucifera and Phoenix dactylifera trees at the south western region of Bangladesh, having a frequency of 12.5% each and density of 13.51% and 8.10%, respectively. Different species under the genus Hypholoma was also reported [36]. In present study, the recorded frequency and density of this species were 2.7% and 1.5%, respectively.

Crepidotus variabilis was found in National Botanical Garden and in National Zoo in association with Cocos nucifera (Coconut) tree [37] where Crepidotus alabamensis was found in association with Cocos nucifera (Coconut) and Crepidotus applanatus was identified in association with Albizia saman (Rain tree). Another study [21] identified Crepidotus variabilis in association with Albizia richardiana (Raj Koroi) and recorded its density 15%. Crepidotus ehrendorferi was found in Slovakia [38]. The new species Crepidotus pseudantinearum and Crepidotus herrerae are described from Costa Rica and Mexico, respectively [39]. In present study, the frequency and density of Crepidotus variabilis were 2.7% and 5.26%, respectively. In other study [37], the calculated frequency and density of Crepidotus applanatus were 25% and 12.5%, respectively.

Pycnoporus sanguineus was recorded only in National Zoo in association with Swietenia macrophylla (Mehogani). In another investigation [15], two species under the Polyporaceae family were identified as- Pycnoporus sanguineus and Polyergus varius. Pycnoporus sanguineus was found on dead wood of Heritiera fomes (Sundari) tree in Mongla and sarankhola Upazilla of Bagerhat district under mangrove forest regions of Bangladesh. In another study [16], Pycnoporus cinnabarinus was found on humus in association with stem of Bambusa vulgaris (Bamboo). This genus contains five distinct species [40]. It was also found within Europe and North America. In present study, the frequency and density of Pycnoporus sanguineus were 1.35% and 1.5%, respectively. Another study recorded frequency of Pycnoporus sanguineus was 50% and the density was 31.82% [15].

Volvariella volvacea was found in National Botanical Garden, Romna Park, Dhanmondi Lake and in National Zoo in association on humus [23]. Three species of Volvariella namely Volvariella gloiocephala, Volvariella volvacea and Volvariella nigrovolvea and one unidentified species of Volvariella were recorded. These were found in Sadar Upazila of Jessore, Sadar of Chuadanga, Koiria of Khulna and Shaminagar of Satkhira districts, respectively under south western regions of Bangladesh [32]. Volvariella volvaceawas recorded in association with Swietenia mahagani (Mehogani), Volvariella volvacea in association with Musa acuminata (Banana), Volvariella nigrovolvea in association with Ziziphus zuzuba (Bori) [32]. Two species of Volvariella under the family Pluteaceae were detected such as Volvariella dunensis and Volvariella gloiocephala found on Dalbergia sissoo and humus, respectively [10]. Volvariella volvacea was also previously reported from Bangladesh forest [22]. In other investigation, two species of Volvariella, namely Volvariella hypopithys and Volvariella speciosa were detected in Mongla, Rampal and Sarankhola of Khulna districts in association with rice straw (Oryza sativa) and humus having a highest density of 18.75% and frequency of 75%, respectively [37]. In another study [23], the recorded frequency and density were 12.5% and 30.23%, respectively. Lepiota atrodisca was
identified only in Boldha Garden in association with *Azadirachta indica* (Neem). In other survey [32], *Lepiota atrodiasca* was found in Gangni of Meherpur districts with a frequency and the density of 12.5% and 75.67%, respectively associated with *Bambusa vulgaris*. Around 400 species of *Lepiota atrodiasca* were already identified all over the world and most of them are poisonous. *Leptota cristata* was found in Refailpur, Daulatpur of Kushtia and Koira of Khulna district in south western region with a frequency and density of 25% and 10.81%, respectively. All *Leptota* species were found at Dhaka district of Bangladesh [22]. This species was found on bark of Sissoo (*Dalbergia sissoo*) tree in the mixed type of forest and the habit was caespitose cluster [37]. He further described that *Leptota atrodiasca* was found in Mongla and Rampal Upazilla of Bagerhat district. A total twenty six number of mushrooms of *Leptota atrodiasca* were found during collection. In present study, the frequency of its presence was 50% and the density was 81.25%. The species was first reported by South African-born mycologist Christian Hendrik Persoon in 1797 [41]. It was also reported from India [30,19]. The recorded frequency and density of its presence were 1.35% and 0.76%, respectively.

*Schizophyllum commune* was found in Romna Park and in National Zoo in association with *Ficus benghalensis* (Banyan) tree. It was found in dead wood of deciduous trees in Nagaland, India [42]. One species of *Schizophyllum* viz. *Schizophyllum commune* was identified in Rampal and Shamnagar Upazillas of that forest regions having the frequency and density of 50% and 40.63%, respectively and was associated with the dead bamboo (*Bambusa vulgaris*) tree [37]. Two species of *Schizophyllum* were found in Rampal Upazilla of Bagerhat district and Shamnagar Upazilla of Satkhira district. The frequency and density of *Schizophyllum* sp. was 50% and 48.57%, respectively. On the other hand, the frequency and density of *Schizophyllum commune* was 50 and 37.14%, respectively. The mushroom was found on the *Bambusa vulgaris* (common bamboo) tree [15]. In present investigation, the recorded frequency and density of its presence were 2.7% and 2.25%, respectively. *Dictyophora indusiata* was found in Boldha Garden and in National Zoo. *Dictyophora indusiata* was identified in association with *Bambusa vulgaris* (Bamboo) tree. The calculated frequency of this species was 2.70% and density was 2.25%.

In the present investigation *Pleurotus ostreatus* was found with a frequency of 2.7% and density of 2.25%. But in earlier *Pleurotus purpureus* was described from National Botanical Garden in association with *Bambusa vulgaris* (Bamboo) tree [32]. *Pleurotus purpureus* was also found in Gangni of Meherpur district in south western region with a frequency and the density of 12.5% and 13.51%, respectively [32]. *Pleurotus sp.* was also investigated in Brazil [43] and *Pleurotus ostreatus* was also reported from Shamnagar Upazilla of Satkhira and Mongla Upazilla of Bagerhat district under mangrove forest regions of Bangladesh [37].

*Marasmius oreades* was found in National Botanical Garden and in Boldha Garden on soil surface. *Marasmius siccus* was found on dead branch of *Albizia procera* (Koroi) and computed its frequency 50% and density 18.75% in mangrove forest region of Bangladesh [37]. Another study found the frequency of *Marasmius rotula* 11.11% and density 8.33% [10]. In Dhaka district of the tropical moist deciduous forest region in Bangladesh, all the three species of *Marasmius* sp. were found [22]. They furthermore added that, in their study, they collected this species from bark wood of tree from Romna park. It contains about 500 species [18] and it was also reported in Madagascar as well as the Mascarenes [44]. *Marasmius oreades* was found in Koira of Khulna district, having a frequency and density of 12.5% and 8.10%, respectively in an association with *Bambusa vulgaris* [32]. The species was scattered in distribution with unabundant in occurrence and found in the moist weather with the range of 29 to 30 degree celcius temperature. Four species of *Marasmius* such as *Marasmius siccus, Marasmiellus albuscorticis, Marasmius nigrodiscus* and one unidentified species of *Marasmius* were detected in the Khulna district of mangrove forest region in Bangladesh having the second highest density of *Marasmiellus albuscorticis* (106.25%) and associated with the dead leaflet of Coconut (*Cocos nucifera*) tree [37]. In present study, the recorded frequency was 2.7% and density was 2.25%. *Gymnopilus purpuratus* was collected only from National Zoo on humus. *Gymnopilus purpuratus* was found in Daulatpur of Kushtia district in south western region with a frequency and the density of 12.5% and 8.10%, respectively. This species was recorded in association with *Cocos nucifera* (Coconut) tree [32]. In current study, the frequency was 1.35% and density was 0.76%.
Amanita bisporigera was found in National Botanical Garden and in National Zoo on debris.

Amanita sp. was previously described from Pabna, Dinajpur and Dhaka districts of Bangladesh [22]. This species was also reported from India [30]. Amanita cinereovelata was first identified from sal forest of Bangladesh [45]. A total ten number Amanita bisporigera was found in Modhupur and Pathorghata in natural forest zones of Bangladesh on the root zone of Dalbergia sissoo, on leaved forest zones. The frequency of its presence was 11.11% and the density was 20% [27]. Three species of Amanita were also reported in Pathorghata of Borguna districts in the southern region with a frequency and density of 6.25% and 9.30%, respectively in an association with Dalbergia sissoo (Sissoo) tree [23]. Also found in forest of northern Thailand [46]. In present survey, the recorded frequency of its presence was 2.7% and density was 5.26%.

5. CONCLUSION

The most frequent genera of macro fungi samples in selected parks and gardens of Dhaka city were Ganoderma, Daedeleopsis, Ramariopsis, Crepidotus, Daldinia, Amanita, Volvariella, Gymnopilus, Agaricus, Marasmius, Schizophyllum, Dictyophora, Pleurotus. The maximum density of occurrence was exhibited by Ramariopsis kunzei (11.3%), Ganoderma lucidum (9.9%), Ganoderma applanatum (7.4%), Crepidotus variabilis (5.3%), Amanita bisporigera (5.26%), Ganoderma tsugae (5.2%), Volvariella volvacea (4.5%), Agaricus bisporus (4.5%), Daedeleopsis confragosa (3.76%). Among these, the predominant species in National Botanical Garden is Ganoderma applanatum, in Ramna Park is Ganoderma lucidum, in Dhanmondi Lake is Ramariopsis kunzei, in Boldha Garden is Ganoderma lucidum and in National zoo is Amanita bisporigera. This study emphasizes periodical and successional survey so that a vast varietal genome might be preserved.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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