Inventory of Plant Moss Species (Bryophyta) Terrestrial In National Park Area AketajaweLolobata Central Halmahera North Maluku Province

Wirda A. Z. Umagap
Lecture of Tadris Biology IAIN Ternate, Indonesia
Email: widhadrakel@gmail.com

Abstract. The objective of research is to inventory and identify the types of plant moss (Bryophyta) terrestrial in the area TNAL. The research sites were conducted in the Totango river water flow of TNAL area and identification was done in laboratory IAIN Ternate. Using exploration methods and collections of flora by way of roamings along the observation path or adjusted to the state of the field. The data are presented in descriptions in terms of morphology and environmental parameters, as well as a general description of the habitats of each identified moss species. Based on the results of research that the plant moss (Bryophyta) terrestrial found as many as 54 species in TNAL along the river route Binagara village and has been identified as many as 30 species. The results of identification of moss plants were divided into 2 classes and 23 families. Class Hepaticae there are 10 species with 8 families. While the Mosses class as many as 20 species with 15 families. In TNAL also found a new type of moss and has not been found in other areas is the type of Fossombronia sp. There are also types of moss is not widely known by the local community. Morphology type of moss that many have capsules, spores, interesting leaves, and seta gentle stems. TNAL as a place of growth of moss plants that is at temperatures ranging from 18 º C - 20 º C standard category, so any air humidity range 85% -98% is still the standard category, with altitude of place 0-1.175 mdpl.

Keywords: Inventory, Plant Type Moss (Bryophyta), Terrestrial.

1. Introduction
1.1. Background
National Park AketajaweLolobata is a natural conservation area that is now a protected forest area, and designated as a national park because as a protector of the series from the lowlands to the mountains and most of the land biodiversity. National Park AketajaweLolobata is an area that represents and protects biodiversity specifically in Halmahera [1]. Biodiversity is the wealth of life on earth, in the form of plants, animals, microorganisms, genetics and their ecosystems built into the environment [2]. This one national park is located in Halmahera Maluku Northern Indonesia, or more precisely in Central Halmahera and East Halmahera [3]. The forest within the park also has various types of forests based on succession levels and needs of flora and fauna, namely primary and secondary forests. AketajaweLolobata National Park has a number of plant species that have not been
specifically and thoroughly identified, including plant or vegetation species [4]. There are several villages in this area, one of which is the village of Binagara as a transmigration village rich in nature.

Moss is a group of plants belonging to the division of Bryophyta and is also a group of small plants that grow attached to the substrate of trees, dead wood, decaying wood, litter, soil and rocks. According to Touw, Bryophyta consists of 1500-2000 species of mosses (true moss) and 1500-2000 types of liverwort (liverweed) representing 20% -30% of all bryophyte species [5]. In life, moss is influenced by environmental factors. Each type of moss requires abiotic environmental conditions to be alive. This plant lives fertile and is often found in a humid environment [6]. Moss is one of the low plant species and part of biodiversity that has not been widely studied because at first glance it appears not to attract attention and even often regarded as the cause of the environment becomes dirty. However, when observed carefully some types of moss plants is quite interesting, both from color and life in groups to form pads such as carpets [6].

Research on moss plants in some areas in Indonesia has been done among others in Sulawesi recorded 106 species [7], and in Borneo reported 607 species [8]. In addition there are several islands that are included in the Sunda Kelapa islands also reported the number of leaf moss, namely in Bali recorded 169 species, Lombok 152 species, Sumbawa 44 species, Flores 278 species, and Timor 46 species [9], while the diversity of moss leaves (Musci) in Bogor and surrounding areas were reported by Fleisher 1900-1908 amounted to 452 species [10]. In the framework of making moss garden in the Cibodas Botanical Garden has been done exploration in several places in West Java such as Mount Gede Pangrango, Mount Salak, Geulis Cianjur mountain and some other places such as Mount Slamet in Central Java, Jambi and Kalimantan. The amounts that have been collected and available for planting in the garden of the lichen collection are 325 species [11].

Bryophyta is one small part of the flora that has not been much excavated, and is also one part of the proponents of flora diversity. Bryophyta plant inventory in North Maluku has not been revealed particularly in primary and secondary forests as protected forests in the area of Aketajawe National Park. This is based on the results of herbarium specimen collection checks in Herbarium Bogoriense has never been found specimen or report on North Maluku moss. Based on the above, then it is conducted research on National Park Area AketajaweLolobata Central Halmahera.

1.2. Objective
The Objective of research is to inventory and identify the Types of Terrestrial Plants of Moss (Bryophyta) In the National Park Area AketajaweLolobata Central Halmahera North Maluku Province.

2. Research Method
This research was conducted by way of exploration to observe and take the types of moss plants found along the Totangoriver. The area of ± 3 ha exploration in the watershed area in the forest of AketajaweLolobata National Park. This research was conducted in Totango river area of AketajaweLolobata National Park and in labolatorium IAIN Ternate as a place to take and identify moss plant species. Time spent for 2 months. The samples in this research are the types of moss plants (Bryophyta) teristerial Area of AketajaweLolobata National Park which is inventoried. Data on plant species were presented in a morphological form complemented by site height and habitat depiction in general from each identified moss species. And it made determination (morphology and anatomy of moss plants). In this research done with several stages namely: in the field (observation at research sites in TNAL area by cruising along Totango river Binagara village) and in the laboratory (specimens of collected moss are preserved by drying or aerated to avoid damage in morphological and anatomical form of plant organ).
3. Results and Discussion

Based on the research that has been done in the area of AketajaweLolobata National Park along the river Totango Resort Binagara found as many as 58 moss plants, after being identified into 30 species of moss plants are grouped into 2 classes of Hepaticae class of 9 families and Musci as many as 14 families and environmental parameters varying range. Of the 30 species of moss plants that have been found there is a new type of type Fossombronia sp (Liverwort) of the musci class. Data of the most types are presented in the form of description of which are:

3.1. Pallavicinia iyellii

*Pallavicinia iyellii* (ribbon heart liver) of the Pallaviciniaceae family of this species are commonly found on soil and rock surfaces or in water sources. The characteristics of this moss are dark green shiny. The texture of the talus is very smooth and rather thin, rovidal ventral. Male talus produces anteridia with 2 rows parallel to the ventral and dorsal surface. While the female talus produces arkegonium as in the cup and appears at the tip of the talus. Sporophytic moss has a long seta clear white with black capsule selindris. Moss of the liver is found In the TNAL on the plateau along the river in Binagara village on the rock and ground surface, also in the bird observation track.

3.2. Calypogeia tosana

*Calypogeia tosana* (Liverwort) of the Calypodeiaceae family in general from the genus Calpogeia which is found near the surface of the soil. Pale green or brown is green and slightly shiny. This plant is easily recognizable by epiphytes at the peak of the culmination of each leaf. Generally, it is associated with other liverwort less related. In the yellowish green thallus, the leaves cover, the concave, the cells on the leaves are made up of several cells, with the shape of a line on the edge of the leaf. Have autoicous; sex of the organ / body part is not visible. Moss of the liver is found In the TNAL on the plateau along the river in Binagara village on the rock and ground surface, also in the bird observation track.

3.3. Metzgeria furcata

*Metzgeria furcata* (Forked Liverwort) of the Metzgeriaceae family is a smaller type of moss compared with *M. conjugata*, measuring about 0.5-1cm and 0.3-1mm wide. But this species is commonly found living together with other liverworts that are attached to tree trunks or decayed wooden stems, the lebab arevery shiny and rough when dry. This plant has a green, light-branched thallus, slightly inverted, midrib differs, rarely has hair like hard hairs along the periphery as well as on the side of the midrib fins, asexual shoots arise from the edge of it. For dioicous consisting of antheridia at the top of the fork, the male arrangement above the flower stalk also branches off. Distribution is widely presented in cold regions, at 400m altitude. Moss of the liver is found In the TNAL on the plateau along the river in Binagara village on tree trunks and decayed wood, also in the path of bird observation.

3.4. Fossombronia sp

*Fossombronia sp* (Liverwort) of the family Fossombroniaceae is a type of moss that is closely related to Jungermannia, this species is characterized by (1) interesting plants, (2) large leaf cells, and stripes, (3) small oily bodies, homogeneously, (4) unistratose leaves at the bottom of the part, (5) companulateseudoperianths and (6) spherical capsules with a short seta. This species is recognized by large spores with different distal sides, leaves slightly wavy along the edges and very less. The stems are shiny green, and bright, but the leaves have a length of 7mm and 3-3.5 in width. On the edge of the leaves slightly choppy with the size 1.2-1.5 mm wide and 0.8-1.2 mm; the lower part of the leaf; rhizoids puple, stems; has 20 homogeneous leaf cells, spherical, midline 2-4μm, in the middle of large, size 30 -56 x 32-112 μm. Autoicous: has an almost spherical capsule, with a diameter of 0.72-0.84mm, brownish yellow spores, midline 38-48 μm. Moss of the liver is found In the TNAL on the plateau.
along the river in Binagara village on tree trunks and decayed wood, also in the path of bird observation.

3.5. **Bazzania sp**

*Bazzania sp* (*Moss whip*) of the Lepidoziaceae family is a moss belonging to leafy liverweed. Growing on top of humus or sticking to rotting trees or wood. The branches are around 3-8mm wide. The leaves are arranged incubous, curved and rounded edges. This plant also has lobul. Ventral leaves are smaller and rounded. Leaf cells are round. Has a long rizoid, it grows perpendicular and colored brownish yellow. Moss of the liver is found In the TNAL on the highland plains along the river line in the village Binagara in the trunks of rotting trees, also in the path of bird observation.

3.6. **Tricocholea sp**

*Tricocholea sp* (*Liverwort*) from the Tricocholeaceae family, the moss grows on rotted wood or tree trunks. Mossy leafy liver is yellowish-green liver with pinnate branches. The main stem has many secondary branches growing on the trunk. Moss of the liver is found In the TNAL on the highland plains along the river line in the village Binagara in wood and tree trunks, also in the path of bird observation.

3.7. **Machantia geminata**

*Machanatia geminata* (Marchantia) of the Marchantiaceae family are easily found in TNAL. This type of plant is included in the plant and blackish purple talus, on the surface of the leaf there is a talus with 2 rows of scales. It has a female and male receptacles and the tip of a fingered lobes 4. The liver of the liver is found In the TNAL on the river plateau area in Binagara village located on the rock and ground level it is also on the bird watching track.

3.8. **Metzgeria decipiens**

*Metzgeria decipiens* (*moss liver cutting*) from the Metzgeriaceae family is easily found at the base of tree trunks, bark of tree trunks, or rotted wood. Often also join the moss liver and other true moss. This species has a simple morphological structure, the cells on the leaves and the trunk-shaped talus like a fork, are bright green. When dry it turns grayish-green on the edge of the long-haired talus. This moss can reproduce itself with vegetative buds in the form of ventral talus. Moss of the liver is found In the TNAL on the plateau along the river in Binagara village on the rock and ground surface, also in the bird observation track.

3.9. **Ptychanthus striatus Nees**

*Ptychanthu striatus* Nees (*Lejenea*) of the Lejeuneaceae family, including epiphytic moss species, are often found to be drowsy at the base of the tree, rather large in size about 10-12cm long, 1-3 mm wide, dark green and dry in brownish green. Moss stems are rigid, branched, pinnate. The leaves consist of 3 rows, lateral leaves composed of incubous, part of large lobe oval with pointed tip. The cells in the middle of the leaf strand have a sacon of the heart, while the small rectangular lobes with 1-3 teeth at the end, ventral pinnate leaves, oval. The liverworm is found in the TNAL on the highland plains along the river in Binagara village at the base of the tree trunk and often found in water sources, also in the path of bird observation.

3.10. **Spruceanthus polymorphus**

*Spruceanthus polymorphus* (*Lejenea*) of the Lejeuneaceae family are included epiphytic plants, growing creeping but not strongly attached to rocks, when dry to dark green to brownish yellow. The stems are rather stiff, irregular branches. The leaves are arranged in 3 rows, the lateral leaves of large oval widened, the ventral shape, the rounded end and the short tapered. The cells in the isodiametric leaf blade, have large trigons and contain more homogeneous oil bodies. Branching stems panajang about 1-2 branches. The liverworm is found in the TNAL on the highland plains along the river in
Binagara village at the base of the tree trunk and often found in water sources, also in the path of bird observation.

3.11. *Lopholejeunea wittensii* Steph
*Lopholejeunea wittensii* Steph (Lejena) of the Lejeuneaceae family is an epiphytic moss that grows creeping and is attached to the bark of a tree, when it is pale-green, it is dark brown, rarely wobbly. Leaf 3 rows, leaves lateral menyirapberbentuk large round, leaves lateral and wide. In TNAL, this type of moss is commonly found in upland plains in Binagara village where there are epiphytes in the bark of trees and there are also birdwatching tracks.

3.12. *Acroporium sp*
*Acroporium sp* (True Moss) of the family Sematophyllaceae is a genuine moss that grows epiphytically on decaying or living tree trunks, or living in terrestrial soils on the ground. Irregular branches, apical stem ends, leaf edges flat, but toothed. This moss has no leaf bone. The cells on the leaf at the end of the strands form a sigmoid, which progressively extends. It has a brownish stem with thick walls and green leaves. In TNAL, this type of moss is commonly found in the highlands of the river lane in Binagara village where there are epiphytes in the rotted tree trunks and there are also birdwatching tracks.

3.13. *Bryohumbertia walkerii* (Mitt)
*Bryohumbertia walkerii* (True Moss) of the family Dicranaceae is a moss that lives in the mountains and in various sustrats such as soil and moist rocks, also grows on wood topus. This moss is epiphytic. Moss of this type is also in the collection at KRC and GunungGedePangrango area. In TNAL, this type of moss is commonly found in the highlands of the river lane in Binagara village where there are epiphytes in rotted tree trunks and there are also birdwatching tracks.

3.14. *Cryptodicranum armitii* (C. Muhll)
*Cryptodicranum armitii* (C. Muhll) (True Moss) from the family Dicranaceae plant is also in the collection on the River Nahuang (Central Kalimantan). Is an epiphytic plant that looks stiff. It grows in an open place on a tree trunk or branch. The color of the leaves is brownish and broad green, and narrows on the apical part. Leaf blade multiplied. Apical leaf tip. The cells on the apical leaf are round and long. In TNAL, this type of moss is commonly found in the highlands of the river lane in Binagara village where there are epiphytes in rotted tree trunks and there are also birdwatching tracks.

3.15. *Calyptothecium wrightii* (Mitt)
*Calyptothecium wrightii* (Wright’s Flat Moss) of the family Pterobryaceae is a rare moss found in Tai Mo Shan with an 800m altitude. There is a moist stone surface. Moss is a perfect type and has leaves which cannot change when dry. The trunk encircles the surface of the stone, and branches straight. stem; perfect creeping, leaves covering, long branch 20mm. dark green, wide and small rods, impricate branches, glossy, concave, borderline bend inward, have costa and shorter. In TNAL, this type of moss is commonly found in highland plains in Binagara village where there are epiphytes on the rock surface, also in bird observation tracks.

3.16. *Homalia trichomanoides* (Hedw)
*Homalia trichomanoides* (Hedw) (Flat Moss) of the Neckeraeceae family is a small moss normally found on the surface of a rock or moist tree near the current. It has many branches and leaves are completely complex and unchanged remains of both size and color, even when dry. Trunk; small, creeping, producing many branches with not always straight at a certain time, end branches collect, with a length of 2 cm. The leaves are shiny green, long borders. The leaf cell is six-angle to isodiametric. In TNAL, this type of moss is commonly found in upland plains in Binagara village where epiphytes on tree trunks and stone surfaces are also found in birdwatching tracks.
3.17. *Octoblepharum albidum* Hedw

*Octoblepharum albidum* Hedw (*Eight-Toothed White Moss*) of the Leucobryaceae family are white-green moss species and generally spread over trees and are present in all wooded areas. Trunk; straight, small, height 10mm, produce many rhizoids. Leaves; thick, rigid, colorful and simple, apiculate, wider and mostly occupied by a costa consisting of several layers of cells, with a 5mm edge line size, a two-leaf cell. Sporophytes; long seta, 1-3mm high, straight and longitude capsule, peristome has 8 spaced teeth, high caliptra conical. In TNAL, this type of moss is commonly found in the highlands of the river lane in Binagara village where there are epiphytes in the rotted tree trunks and there are also birdwatching tracks.

3.18. *Thuidium laucinoides* Broth

*Thuidium laucinoides* (True Moss) of the Thuidiaceae family are *Thuidium* species found with altitudes of 300m or above sea level. Stick to the moist tree trunk. This plant is a mild moss like feathers and pale green. Trunk; perfect, propagate, produce bipinnate branch size 10mm, many paraphyllia on the stem. Leaf has a rod with a striped edge, has a costa with a length of about 2/3 on the leaves, branched leaves, papillose leaf cells and thick-walled. sporophytes; dioicus, has little seta and capsule. In TNAL, this type of moss is commonly found in the highlands of the river lane in Binagara village where there are epiphytes in the rotted tree trunks and there are also birdwatching tracks.

3.19. *Anoectangium thomsonii* Mitt

*Anoectangium thomsonii* Mitt (*Rolled Leaf Cluster Moss*) of the Pottiaceae family has a character with a central strand inside the rod, which is rolled by a protective leaf. This plant became very like a group in a large form, like a thick sponge that is above the moist stone surface. The rod is spray-shaped but large, unbranched, 30mm in diameter and has a rhizoid. The leaves are blackish-green, standard shaped, and in the middle is very deep. Rolled up when dry, living in damp areas, shoots, midline wrinkled, has black costa, some cells sprout, leaf cell substrate is very thick and large, and square-shaped cells. True moss has no leaf bone. The true moss is found In the TNAL on the plateau along the river in Binagara village on the moist rock is also in the bird observation track.

3.20. *Archidium ohioens* Shimp

*Archidium ohioens* Shimp (*True Moss*) from the family Archidiaceae is an unattractive moss and rare, Moss is also found hidden among the grass on moist sandy soil. This moss is not visible capsule. The trunk is tall and branched straight 3-10mm in size, there is a rhizoid. The leaves are slightly shiny, have strong costa, quadrilateral leaf cells with 50-70πm wide cell width and 6-10πm slightly longer and Tinted green. The true moss is found In the TNAL on the plateau along the river in Binagara village on the surface of the soil is also found in the bird observation track.

3.21. *Acanthorrhynchium papillatum* (Harv)

*Acanthorrhynchium papillatum* (Harv) (*True moss*) from the family Archidiaceae is an unattractive moss and rare, Moss is also found hidden among the grass on moist sandy soil. This moss is not visible capsule. The trunk is tall and branched straight 3-10mm in size, there is a rhizoid. The leaves are slightly shiny, have strong costa, quadrilateral leaf cells with 50-70πm wide cell width and 6-10πm slightly longer. Tinted green. The true moss is found In the TNAL on the plateau along the river in Binagara village on the surface of the soil is also found in the bird observation track.

3.22. *Vesicularia reticulate* (Dozy &Molk)

*Vesicularia reticulate* (Dozy &Molk) (*Net Bladder Moss, Erect Moss*) of the Hypnaceae family is epiphytic moss in wet and damp places in places such as in decayed, decayed trees or trees. The moss is also collected from around KRC. Colored green, has a tight and irregular branching. The arrangement of spiral leaves, very tapered at the ends and edges of the leaves tightly. Leaf cells are
hexagonal. Rizoid attached to the leaves, brownish. In TNAL, this type of moss is commonly found in upland plains in Binagara village where there are epiphytes on tree trunks and decayed wood, as well as on birdwatching tracks.

3.23. *Didymodom vinealis* Brid

*Didymodom vinealis* Brid (*Twin Teeth Moss*) from the Pottiaceae Moss family is rare and well known in the highlands of 300m. Very thick and growing on a moist rock is hidden among the grass. Moss has a brown color. The stem is not branched and straight, with a height of 30mm, brownish colored on top of red. Leaves have a length of 3mm, edges have the edge, the costa is located at the leaf tip, leaf cells have 2 papillae and thick-walled, and very thin. Sporophytes seta size 15mm, straight capsule wrapped around. In TNAL, this type of moss is commonly found in the highlands of the river lane in Binagara village where there are epiphytes in moist rocks, as well as in birdwatching tracks.

3.24. *Entodon viridulus* Card

*Entodon viridulus* Card (*Green Silk Moss*) from Entodontaceae family is a type of short-sized moss found in tree trunks and on the rock surface. Has a border on the top of the leaf and a little tip. Trunk; creeping and branching, branches and stems are almost the same, with a length of 4cm. Glossy, branches and leaves on the stem, concave-shaped, long edge line except the leaf tip, have leaf cells, there are 2 costa, which is less clear. Sporophytes; seta straight, the length is about 15mm, yellowing color, longitude capsule, deep brown, has calyptra long. In TNAL, this type of moss is commonly found in upland plateau areas in Binagara village where there are epiphytes in tree trunks and stone surfaces, as well as on birdwatching tracks.

3.25. *Macromitrium reinwardtii* Schwaegr

*Macromitrium reinwardtii* Schwaegr (*Umbrella Moss*) from the family Orthotrichaceae is a moss this shape is similar to M. ferriei, with the color of the leaves. This type is smaller in size and there are many cells inside the leaf. Moss is mostly found on the surface of sea water about 300m, creeping on the rock surface, producing short branches, straight, long leaf strands about 6 mm. Leaves are brownish green, oblong-lanceolate stems, have the costa reach the tip-margins leaves slightly and bent back; thick-walled leaf cells, rounded, slightly larger leaf branches; the shape is similar to the brick leaves. In TNAL, this type of moss is commonly found in upland plateau areas in Binagara village where there are epiphytes in tree trunks and stone surfaces, as well as on birdwatching tracks.

3.26. *Pohlia camptotrachela* (Rens & Card)

*Pohlia camptotrachela* (Rens& Card) (*Ground Moss*) of the Brayaceae family is a different type of *Pohliaproligera* found in the same place, this type is found in moist areas. This species also has a bunch of paired leaves. Stem: straight, unbranched, 10 mm high; rhizoids arise from the base. Leaves: green, not shiny; when dry is solid, spreads when moist; oblong-lanceolate, tip size 1.0 mm x 0.2 mm; broadest around the middle; has a border; costa in some cells. In TNAL, this type of moss is commonly found in upland plateau areas in Binagara village where there are epiphytes in tree trunks and stone surfaces, as well as on birdwatching tracks.

3.27. *Philonotis thwaitesii* Mitt

*Philonotis thwaitesii* Mitt (*Small-leaved Apple Moss*) from the family Bartramiaceae is a species that has many small leaves spirally around the stems that are often reddish-green. Generally present in all types of philonotis and also in weeds, gullies, moist stone surfaces, Rods; measuring 10mm, and branched straight. Leaves; seen from the tip of the leaf appears to have a margin, costa, leaf-shaped cells rectangular. In TNAL, this type of moss is commonly found in the highland plains area of Binagara village where there are gutters and moist rock surfaces, also in bird observation tracks.
3.28. *Pogonatum contortum* Brid

*Pogonatum contortum* Brid (Twisted Hair Moss) of the Polytrichaceae family is the largest moss of hair of all the moss found in that place. Generally present in the lowlands. This type has a simple stem and grows around 40mm. These plants are easy to recognize when they form a thick rug over the substrate. The leaves have several layers of cells. This type has leaves that are dark green striped edges and easily observed with the common eye. The rod is perpendicular, with a height of 50mm, a brown color and a lower leaf cover. The female sporophytes are shorter, producing a straight set with a length of 30mm, there is a capsule covered by rugged calyptra hair. In TNAL, this type of moss is commonly found in upland plains in Binagara village where there are epiphytes on tree trunks and decayed wood, as well as on birdwatching tracks.

3.29. *Trisinegistia sp* Muell. Hal

*Trisinegistia sp* Muell (True Moss) from the family Sematophyllaceae is a plant that can look shiny, forming a clump that looks stiff. Epiphytic plants in tree roots or bark are decaying on the floor of tropical rain forest. The main stem is long and grows creeping. Secondary branches are shorter and grow upright. Usually up on the apical end of many branches. Saun on oval shaped stem and part of leaf strand there is alar cell. This true moss belongs to species located in Indonesia, Malesia, Papua New Guinea and Australia. In TNAL, this type of moss is commonly found in upland plains in Binagara village where there are epiphytes on tree trunks and decayed wood, as well as on birdwatching tracks.

3.30. *Frullania apiculata*

*Frullania apiculata* (Moss of True Brown Chocolate) from the Frullaniaceae family is an epiphytic moss plant that creeps on trees. When viewed under a microscope it has dorsal and ventral parts on the leaves. These lichens are numerous in stems, small in size, not more than 1mm wide, mostly grown creepy and firmly attached to the substrate, green or exposed to direct light can be brownish and purplish, and the branches are pinnate-shaped. The leaves are arranged parallel in 3 rows, lateral leaves with oval shape, blunt edged edges, ventral leaf-shaped lobes 2 and oval width. In TNAL, this type of moss is commonly found in upland plains in Binagara village where there are epiphytes on tree trunks and decayed wood, as well as on birdwatching tracks.

From the identification of moss in laboratorium that when observed moss morphological characters seen under the microscope is from each species turned out to have differences in cells, reproductive organs and other organs. The parts of moss plant organs include seta, capsule, arterodium, costa, calyptra, receptakel, talus, apical, isodiametrik and spore cells [12].

Environmental parameters data at the research sites in the area of AketajaweLolobata National Park around the river Totango Resort Binagara is a region with a range for temperature, altitude and humidity that have differences. The first day for air temperature with a range of 09.00 hours at 18°C, at 12.00 to 19°C, and at 15.00 to 19°C, the second day at 09.00 to 18°C, at 12.00 to 19°C, and at 15.00 to 20°C, and third day at 09.00 to 19°C, 12.00 range 19°C, and at 15.00 range 20°C. To the altitude of the place is 0-1.75 mdpl because it is located in the area of the southern Aketajawe block. While the air humidity is the first day at 09.00 range of 97%, at 12.00 range of 88%, and at 15.00 range 85%, the second day at 09.00 97% range, at 12.00 range 88%, and at 15.00 range 85%, and the third day 09.00 range of 98%, at 12.00 range 89%, and at 15.00 range 86%.

TNAL has an air temperature ranging from 18°C - 20°C is still relatively slightly high, so even the humidity range 85% -98% is still relatively high category, with altitude of place 0-1.175 mdpl when compared with TN in other regions. In addition to air temperature, air humidity, soil moisture, and pH, the intensity of light affects the temperature and humidity, i.e. the lower the intensity of light reaching the earth's surface, the lower the temperature and the higher humidity [13].
4. Conclusion
The results of identification of moss plants were divided into 2 classes and 23 families. There are 12 species of Hepaticae with 9 families. While the Musci class as many as 18 species with 14 families. At the location of the study also found moss species that do not exist in other areas, then the moss is a new type of moss found in TNAL. Morphology of the type of moss has many capsules, spores, attractive leaves, seta and soft stems. The physical environment of the TNAL has an air temperature ranging from 18ºC - 20ºC is still relatively slightly high, so even the air humidity ranging from 85% - 98% is still relatively high category, with altitude of place 0-1.175 mdpl.

References
[1]. Bashari, H., K. Nurdin. Survei Keanekaragaman Hayati di Kawasan Taman Nasional AketajaweLolobata Halmahera Maluku Utara.LaporanTeknis No. 05 Program Kemiteraan untuk pengelolaan Konservasi di Kawasan TN AketajaweLolobata. Burung Indonesia. Bogor. 2009. Hal 8
[2]. Sujatnika, Jepson P, Soehartono T.R, Crosby M.J & Mardiastuti A. 1995. Melestarikan Keanekaragaman Hayati Indonesia. Jakarta. PHPA/Bird Life International-Indonesia Programme. Hal 152
[3]. Balai Taman Nasional AketajaweLolobata. 2011. Dokumen Rancangan Zonasi TNAL Blok Lolobata. Balai Taman NasionalAketajaweLolobata. Sofifi.
[4]. Grace E, Akmal K, Bahri S. Resolusi Konflik dalam Penataan Batas (Suatu pembelajaran di Taman Nasional AketajaweLolobata, Maluku Utara). 2011. hal 9.
[5]. Hallingback, T and Hodgetts, N. 2000. Mosses, Liverworts and Hornworts, The Nature Conservation Bureau Ltd, Newbury, Oxford, Uk. Hal 2-7
[6]. Hasan, M danAriyanti, N. 2004. Mengenal Bryophyta (Lumut) di Taman Nasional Gunung Pangrango Volume 1. Bogor. Penerbit Taman Nasional Gunung Pangrango. Hal 3
[7]. Windadri, F.I. 2007. Lumut (Musci) di Kawasan Cagar Alam Kakenauwedan Suaka Margasatwa Lambusung. Pulau Buton, Sulawesi Tenggara. Jurnal Biodiversitas. 8(3) : 197-20
[8]. Touw, A. 1978. The Mosses Reported Form Borneo. Hattori Bot. Lab. 44:147-176
[9]. Tan, B.C. 2003. Bryophyta (Mosses). A Handout Lecture of Regional Training Course on Biodiversity And Conservation Bryophytes And Lichen. Bogor. Indonesia. Hal 65
[10]. Jenie, U.A. 2006. Koleksi Bryophyta Taman Lumut Kebunraya Cibodas. Sidanglaya. UPT Balai Konservasi Tumbuhan Kebun Raya Cibodas. Hal 25.
[11]. Gradstein, S.R. 2003. Biodiversity and Ecology of Bryophyta of Tropical Rain Forest. A. Handout Lecture of Regional Training Course On Biodiversity And Conservation of Bryophytes And Lichen. Bogor. Hal 130
[12]. Hasan, M dan Santanachote, K. 2003. A Comparison of The Biodiversity on Moss Genera Between Cibodas Botanical Garden and The Nearby Forest of Mt. GedePangrango National Park. Bogor. Indonesia. hal 83
[13]. Zhu, R. L. dan So, M. L. Mosses & Liverworts of Hongkong jilid 1 dan 2. Heavenly People Depot. Hongkong. 1996.
[14]. Holtz, I, S.R. Gradstein, J. Heinrichs and M. Kappelle. 2001. Bryophyta Diversity, Microhabitat differentiation and distribution of Life From in CostaRican Upper Montane Quercus Forest. Bryologist. Hal 105: 334-348
[15]. Damayanti, L. 2006. Koleksi Bryophyta Taman Lumut Kebun Raya Cibodas. LIPI. Bogor. Hal 20.