Floristic composition, biological aspectrum and phytogeographic distribution of the flora of Mudiyah District, Abyan Governorate, Yemen

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Abstract

The present investigation deals with the different life form categories and biological and in several stages at different periods. A total of 274 species, 189genera, and 66 families were identified. Most of the recorded species were native (80.65%).

Biological spectrum of the present study shows that Therophytes (30.29%) were the most dominating life-form, followed by Chamaephytes (27.37%), Hemicryptophytes (21.89%). Chorological study showed that species belonging to the regions of Somalia Masai (28.83 %) and Sudanian (25.91%), Arabian (21.53%), Irano-Turanian;(20.07%), Saharo-Arabian(18.61%), Mediterranean (17.88%), were most important ecological groups in the investigated area.

Keywords: Moudia district,flora,Chorotype, Life- form, native.

Introduction

Mudiyah is one of 11 districts of Abyan governorate with an area about 1317km^2 (the seventh largest district in Abyan), located in the centre of Abyan between longitudinal range 045º 50 to 046º 50 E and latitudinal range 13º 00 to 14º 00 N, boarded by Jeshan district from the north, Al-Wadaie and Ahwer from the south, Al-Mhafid from the east and Lauwder from the west (Fig.1) (29) .Floristic studies are the first step to investigate the ecology and phytogeography, identify the new plant species, detect destructive factors in natural habitats, and preserve genetic resources (21,31). Flora studies play an important role towards a better understanding of the ecosystem and environment and its plant diversity. There were very little botanical studies about Mudiyah one by Zamiela(39) about ethnobotany and other by Hussein et.al(25) about weeds found in citrus and pepper fields and one about medicinal plants by Abdulghany et.al(3). There are some materials published on the flora of Yemen as a part of the Arabian Peninsula are done (14 ,28); a handbook on the North Yemen flora is published by the Royal Botanical Garden, Kew (UK) (36); and Flora as well as a checklist of South Yemen flowering plants is published by University of Aden -Yemen, (23). Nevertheless, from the 90s towards the end of the last century and beginning of this century a significant amount of information pertaining to the flora of Yemen was unveiled through field work and subsequent publications (2 ,3,5,6,7, 8, 9, 10, 11,14, 16, 17, 18, 22, 24,26, 27, 28,35, 37). Some studies reported that there are about 2810 plant species belonging to 1006 genera and 173 families in Yemen (9,10, 23).

The life forms are manifestations of the total adaptation of their perennating organs (32,38), and has evolved as a direct response to the prevailing environment (13, 4), and are representations of flora adaptations to specific ecological conditions (1) and act as an indicator of nature of existing environmental conditions (33, 18). The dominance of each life form also detects the biological conditions of habitats and ecological dependence on the environment (13). Additionally, the chorotype studies in different vegetation give valuable information to detect plant diversity (35). In Yemen, only a few workers have studied the life forms and biological spectrum of different regions. Besides, no work on life forms has so far been carried out in Mudiyah district.

Though a number of local and foreign botanists distributed to the flora of Yemen it's still far from complete, because of its wide area and the change in a climate so it is still more floristic work is needed to fulfill gaps in Yemen flora.

Aim of study

The present study aims to investigate the flora, life form and chorotype of the vegetation structure in Mudiyah District.

Methods and Materials

Mudiyah is located in the Centre of Abyan between the longitudinal range 45º 50 to 46º 50 E and the latitudinal range 13º 00 to 14º 00 N,.About 12 fields trips were carried on during the period May 2007 - August 2009, and other field trips during 2015 , 2017 and 2020.

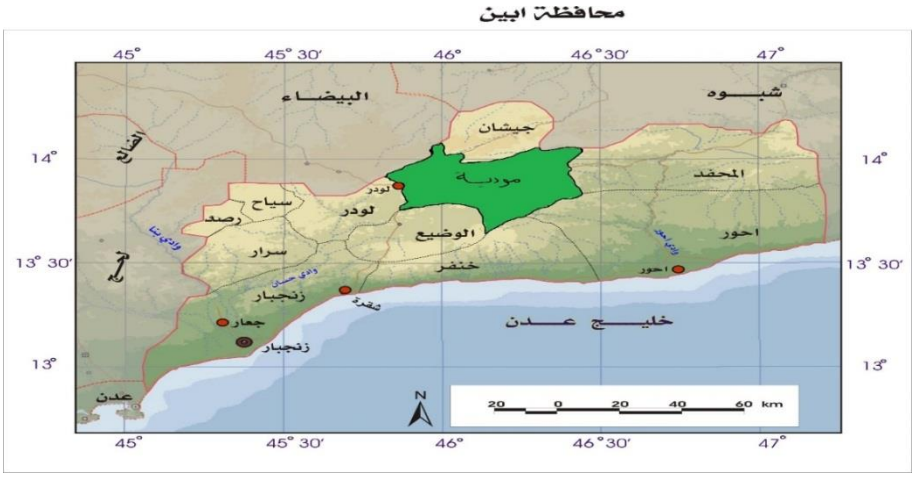

Fig.1: Location of Moudia (after Central Statistical Organization, 2005)

The topography of the study area consists of a number of sharply defined habitats, mountains & cliffs Plate 7 , slopes, wadis Plate 8 , open areas and hills Plate 9 , with an altitudinal range from 1000masl to 1500masl. (39).

The soil of Mudiyah district is mainly shallow soils (Fig.2) (20).

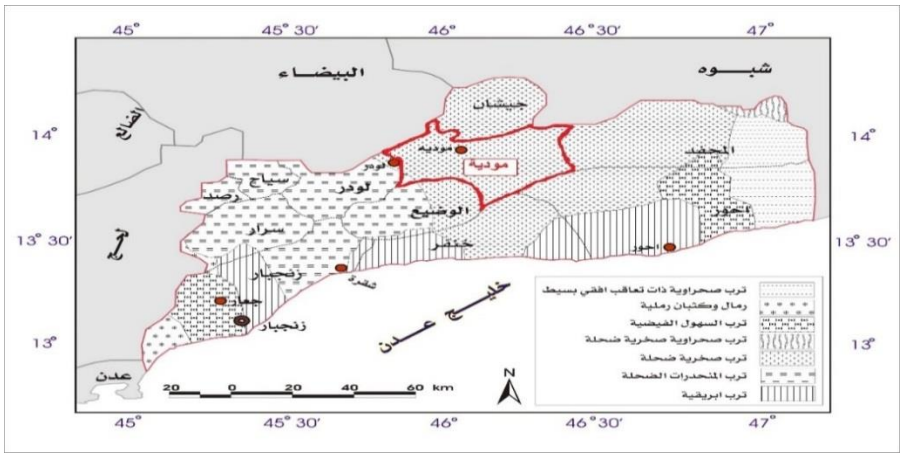

Fig 2. Types of soil in Abyan and Modia . (after Food &Agriculture organization .(FAO) . 1973)

The climate is characterized by high temperature in summer and warm in the winter The area has an arid climate, and the annual average rainfall is 35.1 mm. The rainfall plays such an important role in the determination of the vegetation type, data in Table. (3) and Fig. (3) show that rainfall differs monthly, no rainfall was recorded in June and July, while May recorded the lowest value (0.97mm), the amount of rainfall increased to 20.8 mm in August, while the amount of rainfall in October jump to 25.7 mm (highest amount).(39) .

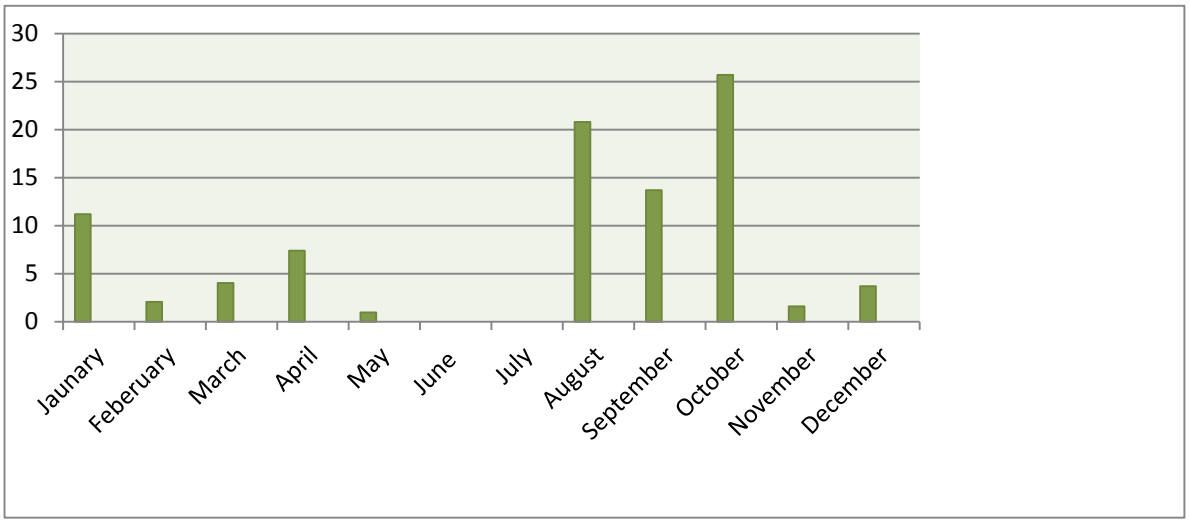

Fig.3.Average quantity of rainfall mm\year

The identification of the specimens was done by the utilization of the available taxonomic and floristic literature (37,28, 5,7, 22,16, 6, 1,37)

Results and Discussion

The topography of the study area consists of a number of sharply defined habitats, mountains & cliffs, slopes, wadis, open areas and hills**.** The topography as well as the rainfall of the study help in the presence of diversity of vegetation. The flora of the investigation area is poor in the vascular non flowering plants. This may be due to that hot climate and less rainfall. The merger of different habitats within the studied area presents a wealth of flora. A total of 274 plant species belonging to 189 genera and 66 families were identified (Table.1).

Table 1. Plant life of Mudiyah District-Abyan Governorate

Chorotype followed, Takhtadzhian, A. L., (1969) Flowering Plants: Origin and Dispersal; Smithsonian Institution Press, 310p.

Families	Scientific names	Status	Life form	Chorotype
Acanthaceae	*Acantha arboreus* Forssk.	Native	Ch	SM. Af.
	Anisotes trisulcus (Forssk.) Nees	Native	Ch	SM
	Barleria proxima Lindau	Native	He	S, SM
	Blepharis ciliaris (L.)B.L.Burtt	Native	He	SA+IT
	Ecbolilum viride (Forssk.)Alston.	Native	He	IT
	Ruellia patula Jacq.	Native	He	IT
Agavaceae	*Dracaena ombet* Kotschy&Peyr.	Native	Ph	S
	Dracaena serrulata Baker.	Near Endemic	Ph	A
	Sansevieria eehrenbergii Schweinf.ex Baker.	Native	G	SM
Aizoaceae	*Gisekia pharnaceoides* L.	Native	Th	IT
	Glinus lotides L.	Native	Th	PAL
	Trianthema crystllina Vahl	Native	Th	SA, SM.
	Trianthema portulacastrum L	Native	Th	PAL.
	Trianthema triquetrum Rottler ex Willd	Native	He	SM
Aloeaceae	*Aloe ahmernsins* Favell,Miller&AlGifri	Endemic	He	A.
	Aloe fleurentiniorum Lavr.&Newton.	Native	He	S
	Aloe inermis Forssk.	Native	He	SA, SM
	Aloe lanata T.A.McCoy&Lavranos.	Endemic	He	A.
	Aloe sabea Schweinf .	Near endemic	Ph	A.
	Aloe vacillans Forssk	Near endemic	He	A.
	Aloe verassp. Sspofficinals (L.) Burm .f.	Near endemic	He	A.
Amaranthaceae	*Achyranthes aspera.* L.	Native	He	IT
	Aerva javanica (Borm .f.)Juss.exSchult	Native	Th	IT
	Amaranthus gracane .L	Native	Th	Cosm
	Amaranthus graecizans .L .	Native	Th	Cosm
	Amaranthus lioides L.	Native	Th	Cosm
	Amaranthus viridis L.	Native	Th	Cosm
	Digera muricata (L.)Mart.	Native	Th	IT
Anacardiadeae	*Mangofer aindica* L.	Cultivated	Ph.	In.
	Rhus flexicaulis Bak .	Native	Ch	Af. S. SM
Annonaceae	*Annona squamosa* L.	Cultivated	Ph.	In.
Apiaceae	*Anethum graveolens* L.,	Cultivated	Th	ME, IT
	*Coriandrum sativum*L .	Cultivated	Th	ME, IT
	Cuminum cyminum L	Cultivated	Th	ME, IT
	Daucus carote L	Cultivated	G	ME, IT
	Foeniculum vulgrae Mill.	Cultivated	Th	ME. IT
Apocynaceae	*Adenium obesum*(Forssk.) Roem. & Schult	Native	Ph	A, SM
	Catharanthus roseus Don	Ornamental	He	PAL
	Nerium oleander L	Ornamental	Ch	PAL
Arecaceae	*Hyphaene thebaica*(L.) Mart	Native	Ph	SA,IT
	*Phoenix dacytlifera*L	Cultiveted	Ph	SA
Aristolochiaceae	*Aristolochia bracteolate* Lam	Native	He	S.SM

Asclepidiaceae	*Angollume commutate* (A.Berger)Plowes	Native	He	SM
	Calotopis procera (Ait.)Ait.f	Native	Ph	SA, SM
	Caralluma awdaliana (Defl.)Berger.	Endemic	He	A.
	Cerapegia arabica H.Huber .	Native	He	A, SM
	Cerapegia bortys K.Schum	Native	Ch	A,SM
	Cerapegia variegate (Forssk.)Decne	Native	Ch	A, SM
	Cerapegia rupicola Defl	Native	Ch	A, SM
	Desmidorchis peniceilata (Deflers)Plowes	Native	He	A, SM
	Gomphocarpus fruticosus (L.)R.BR.&Ait.f.	Native	He	A, S. SM
	Leptadenia pyrotechnica (Forssk.)Decne	Native	Ch	PAL
	Monolluma quadrangular (Forssk.) Plowes	Native	He	A. SM
	Pergularia deamia (Forssk.) Choiv.	Native	Ch	A.SM
	Pergularia tomentosa L	Native	Ch	SA+S
	Sarcostemma viminale (L.)R.Br	Native	Ch	S,SM
Asteraceae	*Artemisia abyssinca* Sch.Bip. ex A.Rich	Native	Ch	ME, SM
	Flaveria trinervia (Spreng.)Mohr	Native	Th	S
	Guizotia scabra (Vis.) Chiov	Native	Th	S, SM
	Lactuca sativa L	Cultivated	Th	Cosm
	Klenia anteuphorbium (L.)Haw	Native	Ch	ME, SA
	Onopordon sibthorpianum Boiss.&Helder	Native	He	ME
	Pulicaria crispa (Forssk.) Benth.	Native	Ch	SA+S
	Pluchea dioscoroides (L.)DC	Native	Ch	SA+S
	Pluchea ovalis (Pers.) DC	Native	Ch	PAL
	Pulicaria jaubertii Gamal-Eldin	Native	Th	S.SM, A
	Pulicaria undulata (L.) C. A. Mey	Native	Th	S
	Sonchus oleraceus L	Native	Th	ME+IT
	*Xanthium spinosum*L..	Native	Th	Neotropic
	Xanthium strumarium L.	Native	Th	ME
Balanitaceae	*Balanites aegyptiaca* Del	Native	Ph	S.SA-SS
Boraginaceae	*Alkanna orientalis* (L.) Boiss.	Native	He	ME. IT
	Heliotropium bacciferum Forssk	Native	He	SA +S
	Heliotropium curassavicum L	Native	He	Neotrop.
	Heliotropium lasiocarpum Fiscer& C. A.Meyer	Native	He	ME. IT
	Heliotropium longiflorum (A.D.C.) Steud. &Hochst.ex Bunge	Native	He	S. SM
	Heliotropium rariflorum Stocks	Native	He	S.SM, IT
	Heliotropium zeylanicum (Burm.)Lam	Native	He	S.SM.IT
Brassicaceae	*Brassica oleracea* L**.**	Cultivated	Th	ME.
	Diplotaxis erucoides L.DC**.**	Native	Th	ME.
	Eruca sativa Miller .	Cultivated	Th	ME, IT
	*Farsetia aegyptia*Turra	Native	Th	SA
	Farsetia stylosa R.Br	Native	He	SA, SM, IT
	Lepidium sativum L	Cultivated	Th	ME, IT
	Raphanus sativus L.	Cultivated	G	Cosm
	Schouwia purpurea (Forssk.) Schweinf	Native	Th	ME +SA
Burseraceae	*Commiphora foliacea* Sprague	Native	Ph	SM. S
	Commiphora gileadeniss (L.) Christ	Native	Ph	S. SM
	Commiphora kataf(Forssk.) Engl	Near Endemic	Ph.	A.
	Commiphora myrrha(Nees) Engl.	Native	Ph	A.SM
Caesalpiniaceae	*Delonix elate* (L.)Gamble	Native	Ph	ME. IT

	Senna alaxindrina Mill	Native	Ch	S. SM
	Senna auriculata (L.)Roxb.	Native	Ch	In.
	Senna holosericea (Fresen.) Greuter	Native	Ch	S. SM
	Senna italic Mill.	Native	Ch	S. SM
	Tamarindus indica L.	Native	Ph.	In.
Cactaceae	*Opuntia ficus –indica* (L.)Mill	Native	Ch	PAL
Capparaceae	*Cadaba farinose* Forssk.	Native	Ch	S.
	Capparis cartilaginea Decne	Native	Ch	S.
	Capparis spinosa L.	Native	He	ME, IT;
	Dipterygium glaucum Decne	Native	Th	SA, S
	Gynandropsis gynandra(L.)Brig	Native	Th	S. SM
	Maerua crassifolia Forssk	Native	Ph	S.+SA
Caricaceae	*Carica papaya* L**.**	Cultivated	Ph.	In.
Caryophyllaceae	*Sterllaria pallid* (Dumort.) Pire	Native	Th	ME. IT
	Polycarpaea repens(Forssk.) Asch.&Schwein	Native	He	ME IT.
Chenopodiaceae	*Chenopodium album* L.	Native	Th	COSM
	Chenopodium glaucum	Native	Th	IT
	Chenopodium murale L.	Native	Th	COSM
	Chenopodium schraderianum Roem&Schultes	Native	Th	IT
	*Halothamnus bottae*Jaub. &Spack	Near endemic	He	A.
	Salsola imbricata Forssk	Native	Ch	S. SM
	Suaeda fruticose Forssk .exJ.F.Gmel	Native	Ch	S. SM
Combretaceae	*Terminalia brownie* Fresen	Native	Ph.	In.
Commelinaceae	*Commelina imberbis* Ehrenb. ex Hassk	Native	He	SM
Convolvulaceae	*Convolvulus arvensis* L	Native	He	PAL
	Convolvulus glomeratus Choisy	Native	He	S
Cucurbitaceae	*Citrullus colocynthis* (L)Schrad	Native	Th	ME,SA-SS
	Cirullus vulgaris Schrad.	Cultivated	Th	Cosm
	Coccinia grandis (L.)Voigt	Native	Th	S, SM
	Cucumis prophetarum L.	Native	He	SA, SM, A.
	Cucumis melo L	Cultivated	Th	Cosm
	*Cucumis melo*L.v.agrestis (Naudin)	Native	Th	SM, A.
	Cucumis sativus L	Cultivated	Th	Cosm
	Cucurbita maxima Duchesne	Cultivated	Th	Cosm
	Cucurbita peop L.	Cultivated	Th	Cosm
	Kedrostis gijef (J.f.Gmel.) C. Jeffrey	Native	Ch	S, SM, A
	Luffa cylindrical (L.)M.J.Roem	Native	Th	SA, SS
	*Momordica balsamina*L	Native	He	S, SM, A.
Cupressaceae	*Cupressus sempervirens* L.	introduce	Ph	ME.
Cyperaceae	*Cyperus rotundus* L.	Native	G	COSM
Euphorbiaceae	*Acalypha fruticosa*Forssk.	Native	Ch	SM, A, In.
	Chrozophora plicata (Vahl.) A.Juss.ex.Spreng	Native	Th	S
	Chrozophora oblongifolia(Del.)Juss	Native	Ch	S
	*Chrozophora tincotoria*A.juss	Native	Ch	SA+ME
	*Euphorbia balsamifera*Ait	Native	Ch	Ca, SA.
	Euphorbia cactus Ehrenb.	Native	Ch	S
	*Euphorbia cuneata*Vahl	Native	Ch	SA +S
	*Euphorbia fruticosa*Forssk	Native	Ch	S. A.
	*Euphorbia granulate*Forssk.	Native	Th	SA +S

	*Euphoria inarticulate*Schweinf.	Natine	Ch	S. A
	*Euphorbia schimperi*Presl	Native	Th	SA+SU
	*Euphorbia triaculeata*Forssk	Native	Ch	SM
	*Jatropha glauca*Vahl	Native	Ch	S. SM, A.
	*Jatropha pelargoniifolia*Cours.	Native	Ch	SM. A.
	*Jatropha spinosa*Vahl	Native	Ch.	SM. A.
	Ricinus communis L	Native	Ch	PAL
	Tragia pungens (Forssk.)	Native	He	SM, A.
Fabaceae	*Cadia purpurea* (G.Piccioli) Ation	Native	Ch	S.SM. A.
	Crotalaria incana L.	Native	He	S
	*Crotalaria saltiana*Andr.	Native	He	S
	Dolichos lablab L	Cultivated	He	Cosm
	Indigofera articulate Gouan	Native	He	S. SM, A.
	Indigofera coerulea Roxb	Native	Ch	S
	Indigofera oblongifloia Forssk	Native	Ch	S
	Indigofera spiniflora Boiss.	Native	He	S, SM
	Indigofera spinosa Foessk	Native	Th	ME
	Indigofera tinctoria L	Native	Ch	SA, SS
	Medicago laciniata.(L.)Mill.	Native	Th	ME, IT
	Medicago sativa L	Native	Th	ME,IT
	Phaseolus vulgaris L	Cultivated	Th	Neotrop
	Rhynchosia minima(L.) Dc.	Native	Ch	S
	Tephrosia purpurea (L.) Pers	Native	Ch	SA, SS
	Vigna unguiculata (L.)Walp .-	Cultivated	Th	S, SM, In.
Geraniaceae	*Erodium ciconium* (L.)L Her	Native	Th	ME, IT
Hydnoraceae	*Hydnora johannis* Bece	Native	G	SA
Lamiaceae	*Leucas articifolia* (Vahl.) R.Br	Native	Ch	ME, IT
	Leucas inflate Benth	Native	Ch	ME. IT
	Marrubium vulgare L.	Native	Ch	ME, IT
	Mentha longifolia (L.)L.	Native	He	PAL
	Mentha piperite L.	Native	He	ME, SM, IT
	Nepta deflersiana (Schweinf. ex) Hedge	Native	Ch	ME, IT
	Ocimum basilicum L	Native	Ch	Me, IT
	Ocimum forskolei Benth.	Native	Ch	SM. A.
	Origanum syriacum L.	Native	Ch	ME, IT
	Plectranthus comosus Sims.	Native	Ch	ME, IT, SM
	Teucrium yemense Deft	Near endemic	He	A.
Liliaceae	*Allium cepa* L.	Cultivated	G	Cosm
	Allium porrum L	Cultivated	G	Cosm
	Allium sativum L	Cultivated	G	Cosm
Longaniaceae	*Buddleia polystachya* Fresen	Native	Ph	SM. A.
Loranthaceae	*Oncocalyx doberae* (Schweinf.) J.R.L.Wood.	Native	Epi	SM. A.
Malvaceae	*Abutilon pannosum*(Forst.f.)Schlecht	Native	Ch.	S
	*Hibiscus meidiensis*Ulbr	Native	Ch.	SM, A,
	Malva parviflora L.	Native	Th	ME, IT, A
	Pavonia triloba Guill.&Per	Native	Ch	S
Meliaceae	*Azadirachta indica* A.Juss.	Native	Ph	In.
Mimosaceae	*Acacia asak* (Forssk.)Willd	Native	Ph	A.S.SM
	Acacia etbaica Schweinf	Native	Ph	A.SA
	Acacia hamulosa Benth	Native	Ph	A.SA.
	Acacia nilotica (L.) Delile	Native	Ph	A.S.SA

	Acacia tortilis (Forssk.) Hayne	Native	Ph	A.S.SA
	Pithecellobium dulce (Roxb.)Benth.	Native	Ph	In
	Prosopis juliflora (SW.)DC	Native	Ph	PAL
Moraceae	*Ficus carica* L.,	Cultivated	Ph	ME
	Ficus cordata Thunb ssp. *Salcifolia*	Native	Ph	ME, IT, A
Nyctaginaceae	*Boerhavia diffusa L.*	Native	Ch	SA +TR
	Boerhavia erectaL.	Native	Th	S,SM, A
	Boerhavia repens L.	Native	Ch	IT
	Bougainvillea glabre Choisy	Ornamental	Ph	PAL
	Commicarpus ambiguous Meikle	Native	Ch	SM
	Commicarpus boissieri (Heim.) Cuf	Native	Th	S
	Commicarpus mistus Thulin	Native	Ch	SM, A
	Commicarpus plumbagineus(Cav.) Standl.	Native	Ch	SM, A.
Oleaceae	*Jasminum grandiflorm* L	Native	Ch.	ME
Orobanchaceae	*Cistanche phelypoea* (L.)Cout	Native	P	ME
	Orobanche cernua Loefl	Native	P	ME
Pandanaceae	*Panadanus odoriferous* (Forssk.) Chiov	Native	Ph.	In,
Papaveraceae	*Argemon emexicana* L.	Native	He	Neotrop.
Pedaliaceae	*Sesamum indicum* L	Cultivated	He	SA, SS
Plantaginaceae	*Plantago lanceolata* L	Native	He	ME, IT
Poaceae	*Aeluropus lagopodlis* L.	Native	Ch	IT+SA
	Aristida adscensionis L	Native	Th	Neotop. S.
	Brachiaria leersioides (Hochst.) Stapf	Native	Th	IT
	Cenchrus ciliaris L	Native	He	ME +IT
	Cymbopogon schoenanthus (L.) Spreng	Native	Th	SM, A.
	Cynodon dactylon (L.)Pers.	Native	G	Cosm
	Dactyloctenium aegyptium (L.)P.Willd	Native	Th	COSM
	Dichanthium foveolatum (Del.)Roberty	Native	Th	IT +SA
	Eragrostis barrelieri Dav.	Native	Th	S.
	Hordeum vulgare L	Cultivated	Th	Cosm
	Odyssea mucronate (Forssk.)Stapf	Native	Ch	S, SM, A.
	Paspalum dilatatum Poir.	Native	He	Neotrop
	Pennisetum glaucam (L.)R.Br	Cultivated	Th	S.SM.A.
	Sorghum bicolor (L.)Moench	Cultivated	Th	SA. S.SM, A.
	*Stipagrostis paradise*a (Edgew.)de Winter	Native	Th	ME. IT. SM, A.
	Urochloa reptans (L.) Stapf	Native	Th	IT, A. In,
	*Zea mays*L .	Cultivated	Th	Neotrop
Polygalaceae	*Polygala erioptera* DC.	Native	Th	SA
Polygonaceae	*Rumex nervosus* Vahl.	Native	Ch	Sa, SM. Af
Polypodiaceae	*Adiantum capillus –veneris*L.	Native	Cr	SS, Sa, SM
Portulacaceae	*Portulaca oleracea* L	Native	Th	COSM
	*Portulaca quadrifida*L.	Native	Th	COSM
Punicaceae	*Punica granatum*L.	Cultivated	Ph	Cosm
Resedaceae	*Ochradenus baccatus*Del.	Native	Ch	SA
	*Reseda sphenocleoid*Defl	Near endemic	Ch	A
Rhamnaceae	*Phyllogeiton discolor* (Klotzsch) Herzog.	Native	Ph	Af, S, SM
	Ziziphus spina-christi (L.)Willd	Native	Ph	SA + S
Rutaceae	*Citrus aurantiifolia* (Christm.) Swingle	Cultivated	Ph.	Neotrop.
	Citrus sinensis (L.)Osbeck .	Cultivated	Ph	ME.
	Ruta chalepensis L	Native	He	IT

Salvadoraceae	*Salvadora persica* L.	Native	Ch	SA, SS, S
Sapindaceae	*Dadonaea viscosa* L.	Native	Ch	Cosm.
Scrophulariaceae	*Anticharis glandulosa* Aschers.	Native	Th	S, SM, A. In.
	Bacopa monnieria (L.)Wettst	Native	Cr	Cosm.
	Striga hermonthica (Del.)Benth.	Native	P	SA, SM
	Veronica polita Fries	Native	He	ME
Solanaceae	*Capsicum frutecens* L	Cultivated	He	Neotrop.
	Datura innoxia Mill	Native	He	COSM
	Datura stramonium..L.	Native	He	Neotrop
	Lyceum shawii Roem&Schults	Native	Ch	A., SM, S
	Lycopersicum esculentum Mill	Cultivated	Th	Neotrop.
	Solanum coagulans Forssk	Native	He	S, SM, A.
	Solanum forsskali Dunal	Native	He	A, SM
	Solanum incanum L.	Native	Ch	S
	*Solanum melongena*L.	Cultivated	He	Neotrop.
	*Solanum nigrum*L.	Native	Th	COSM
	Solanum tuberosum L	Cultivated	Th	Neotrop.
	Solanum villosum (L.)Lam	Native	Th	Af, SM
	Withania somnifera (L.) Dun.	Native	Ch	SA, S
Tamaricaceae	*Tamarix aphylla* (L .) H.,Karst	Native	Ph	S
Tiliaceae	*Corchorus depressus* (L.)Christ	Native	Th	ME + SA
	Corchorsus olitorius L	Native	Th	IT
	Corchorus tridens L.	Native	Th	IT
	Corchorus trilocularis L	Native	Th	IT
	Grewia erythraeae Schweinf	Native	Ph	SM. S
	Grewia velutina (Forssk.)Vahl	Native	Ph	IT
Urticaceae	*Forsskaolea tenacissima* L .	Native	Ch	SA+S
Vitaceae	*Cissus quadrangularis* L	Native	Ch	SA, S.
	Cissus rotundifolia Vahl	Native	Ch	SA +S
Zygophyllaceae	*Fagonia indica* Burm.f.	Native	Th	SA
	Peganum harmala L	Native	He	IT
	Tribulus terrestris L	Native	Th	ME +IT
	Zygophyllum simplex L	Native	Th	SA

Life-form; ph = phanerophytes ,Ch = chamaephytes, H = hemicryptophytes, Cr = cryptophytes, Th = therophytes, HE = hemiepiphytes, Ep = epiphytes, The chorotypes are: SM: SomaliaMasai; SA:Saharo-Arabian; S: Sudanian;A: Arabian;IT, Irano-Turanian; ME:Mediterranean; Cosm: Cosmopolitan;PAL: Paleotropic; In: Indian; Ca: Canary islands; SU, Sudano -Zambezian; TR:Tropical; PAL: Paleotropic; Neotrp: Neotropic; SS: SaharoSindian; Af: Afromontane archipelago-like;

Table.2. Status of Plant Life in Mudiyah District- Abyan Governorate

Status	No. of species	Percentage
Native	221	80.65 %
Cultivated	38	13.86 %
Near endemic	8	2.91 %
Endemic	3	1.09 %
Ornamental	3	1.09 %
Introduce	1	0.36 %
Total	**274**	**100**

The major plant present in the area in question were native (80.65%) followed by cultivated (13.86%), near endemic (2.91%), endemic (1.09%), Ornamental (1.09%) and introduced (0.36%) as shown in Tabl.2 and figure.4.

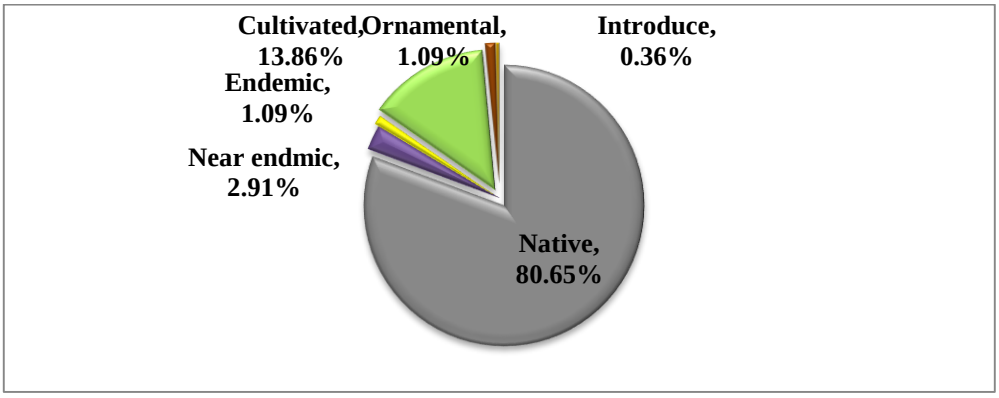

Figure 4. Status of Plant Life in Mudiyah District- Abyan Governorate

The life form is assumed to have evolved in direct response to the environment and accordingly, the proportion of life forms in an area can give a good indication of its phyto-climatic zone. The life-form composition in the study area is dominated by Therophytes (30.29%) followed by Chamaephytes (27.37%), Hemicryptophytes (21.89%), Phanerophytes (14.96%), Geophytes 3.28%),Parasites (1.09%), Cryptophytes (0,72%) and Epiphytes 0.36%).as shown in table 3 and figure 5. Thus, these characters of, therophytes, and chamaephytes show dominance, these results are in agreement with those of (8) as well as with over the other life form in the neighbor countries such as Taif of Saudi Arabia, Mosallam [61] reported that the dominant life form of that region are therophytes and chamaephytes while Saadiya et al. [34] reported the same results from South-Western Saudi Arabia, Asir region of Saudi Arabia. The plants, however, being a hilly and mountainous terrain much of area receives less water causing a higher percentage of Therophytes and Chamaephytes, which are characteristics of semi- arid regions.

Table 3. Different life –forms classes of Mudiyah District

Life form classes	Abbreviation	No. of species	Percentage
Therophytes	Th	83	30.29 %
Chamaephytes	Ch	75	27.37 %
Hemicryptophytes	He	60	21.89 %
Phanerophytes	Ph	41	14.96 %
Geophytes	G	9	3.28 %
Parasites	P	3	1.09 %
Cryptophytes	Cr	2	0.72 %
Epiphytic	Ep	1	0.36 %
Total		**274**	**100**

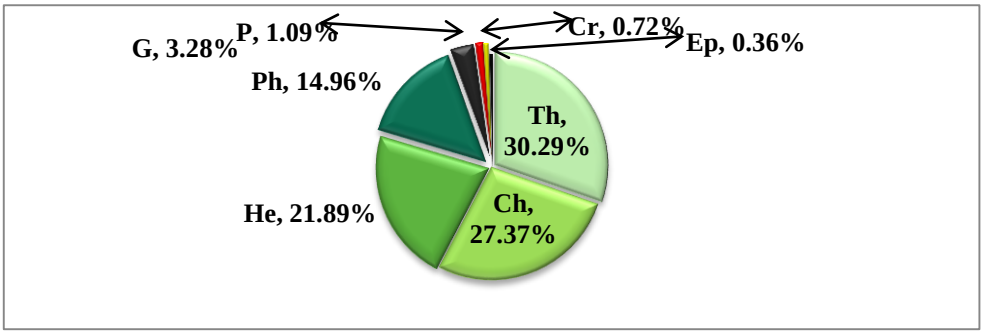

Figure 5. Different life –forms calasses of Mudiyah District

Figure -6. Table -4. showed that chorological characteristic of the recorded in flora of Mudiyah, showed that Somalia Masai region elements recorded the highest number (28.83 %), followed by Sudanian elements (25.91 %). In addition to plant species that belong to the Arabian regional (21.53%) and theIrano-Turanian20.07 %, Saharo-Arabian (18.61 %), Mediterranean (17.88 %), Cosmopolitan (10.22 %),Paleotropic (6.56 %), Indian (4.74 %),Neotropic(4.74 %), Saharo Sindian(2.91 %), Afromontane archipelago-like(1.8 %), Canary islands (0.36 %), Sudano - Zambezian(0.36 %), Tropical (0.36 %).

Table.4. Chorological types spectrum in flora of Mudiyah

Chorotype	No. of species	Percentage
SM	**79**	**28.83 %**
S	**71**	**25.91 %**
A	**59**	**21.53 %**
IT	**55**	**20.07 %**
SA	**51**	**18.61 %**
ME	**49**	**17.88 %**
Cosm	**28**	**10.22 %**
PAL	**18**	**6.56 %**
In	**13**	**4.74 %**
Neotrop	**13**	**4.74 %**
SS	**8**	**2.91 %**
AF	**5**	**1.8 %**
Ca	**1**	**0.36 %**
SU	**1**	**0.36 %**
TR	**1**	**0.36 %**

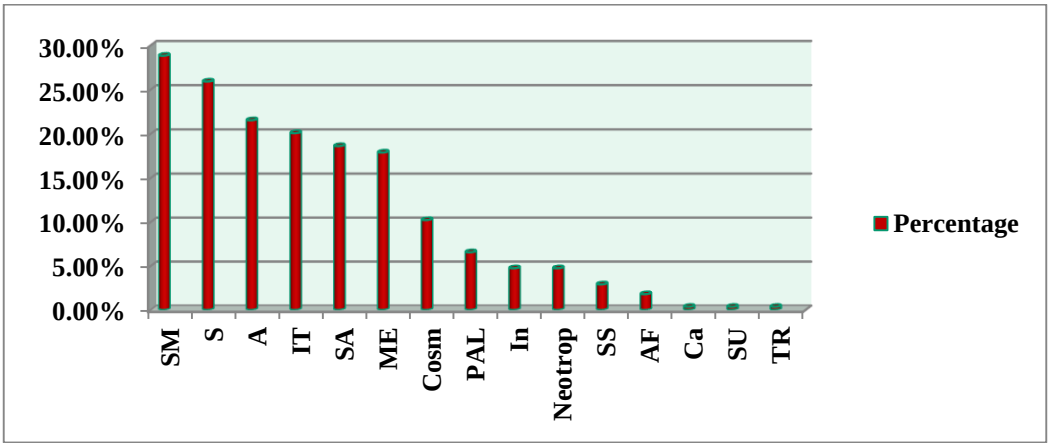

Figure 6. Chorological types spectrum in flora of Mudiyah.

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التركيب الفلوري والاشكال الحيوية والانتماء الجغرافي لنباتات مديرية مودية محافظة أبين / اليمن

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الملخص

تناقش هذه الدراسة مختلف فئات أشكال الحياة والطيف البيولوجي لمديرية موديه. تم جمع جميع العينات خلال مواسم مختلفة وفي عدة مراحل في فترات مختلفة، ثم تم التعرف عليها وتصنيفها. أظهرت الدراسة وجود 274 نوعًا نباتيًا تنتمي الى 182جنسًا وتضمها 66 فصيلة نباتية.

اظهر الطيف البيولوجي أن النباتات Therophytes تشكل أعلى نسبة (30.29%) وتُعد السائدة في منطقة الدراسة تليها كل من Chamaephytes (27.37%) و(21.89%) Hemicryptophytes .

أظهرت الدراسة أن الأنواع التي تنتمي إلى مناطق Somalia Masai (28.83 %) and Sudanian (25.91 %), Arabian (21.53%), Irano-Turanian;(20.07%),Saharo-Arabian(18.61%), Mediterranean (17.88%), تُعد أهم المجموعات البيئية في منطقة الدراسة.

الكلمات المفتاحية: مديرية موديه ، فلورا، الانتماء، أشكال الحياة، المنشأ.