

ECONOMIC IMPORTANCE OF *Nypa fruticans* IN THE NIGER DELTA REGIONS OF NIGERIA

Akpan, U. F, Akpan, F. S, Oladele, O. N, Malizu, L. C. and Odey, B. O.
Forestry Research Institute of Nigeria

Abstract

Nypa fruticans (nypa palm, mangrove palm) is a useful, versatile and fairly common component of the mangrove forest of Niger Delta. Although, it is regarded as weed from Asia that have taking over the mangroves of Nigeria and is being cut down. The economic plant has productive usage value that is of most valuable for degraded mangrove. Its sustainable roles include both ecologically as a protection to the environment and economically as a natural resource. The fossil palm has a host of local subsistence uses like medicines, hat, raincoats, roof material, for thatched houses, basketry, poles, as animal feed, as food, local tea, local desserts, beverage, sugar, vinegar, ethanol/alcohol, buttons, necklaces and other fashion apparels. Nypa palm has an opportunity to reforest most mangrove areas in Niger Delta with oil spillage and deforestation. *N. fruticans* is a sustainable tool of the Delta that can address global problems like poverty, global warming, climate change, environmental degradation and sustainable development.

Email: udemeakpe@yahoo.com. 08034697236

Introduction

Nypa fruticans Wurmb is the only Palm considered as mangrove in the mangroves biome. It belongs to the family Palmae (Araceae); the species is a monotypic taxon and the only one in the genus *Nypa*. It grows in Southern Asia and Northern Australia ecozone. The palm is the oldest known fossil (John and Robert, 1993 and Ria Tan, 2001), with pollen dated to million years old. It is a common, widely distributed and useful palm of the mangrove forest that occurs in Asia and the Oceanic regions and was introduced into West Africa particularly Nigeria in 1906 (Holland, 1922; Zeven, 1973; Lawarence and Dennis 1988). It is common on coasts and rivers flowing into the Pacific Ocean and Indian Ocean. Fossil *Nypa* Pollen has been found throughout the world; from the London clays, the Bass Strait sediments, the deserts of Asia Minor and South America and currently in Nigeria. The reasons for the abundance of *Nypa* fossils could be explained by the very nature of its habitat, where recurrent flood and sedimentations events predispose the species to the formation of fossils. Again lack of utilization of nypa has given rise to its influential characteristics in our environment.

Nypa grows in soft mud and slow moving tidal and river waters that bring in nutrients. It occurs mostly in areas where brackish water occurs, extending far upstream into permanent fresh water areas where there is tidal influenced and water level fluctuations

are able to carry and deposit the seeds. It tolerates infrequent inundation, so long as the substrate in which it grows does not dehydrate for too long a period. The unique mangrove species appears to be in pure stand on islets or low flats on the inside of river where fine, rich silt deposits occur. *Nypa* does not really require saline conditions at all as the luxuriant stands in pure freshwater indicates its tolerance of an average low salinity.

The palm grows as an undershrub and can dominate in mixed forest. *Nypa* palm appears to lack a trunk; in fact, it has a horizontal trunk that grows beneath the ground. The branch trunks end each with a bunch of fronds. The base of the frond is air filled to help it stay upright and grow upwards above the surface forming leaves and flower stalk. The unusual tree has the leaves that can extend up to 9m in height and fruits form like a large ball rising from the mud on a stalk. When it ripens the ball breaks away and breaks up into individual fruits which float away with tide and occasionally germinating while still water born.

***Nypa* Palm in Nigeria**

Nypa fruticans is commonly called ayamatangh or ayangmbakara in Nigeria. It was introduced into Nigeria in old Calabar in 1912 with seeds from the Botanic Gardens of Singapore as a trial plantation and subsequent plantation initiated in Oron. Afterward, seeds originated from Malaysia were planted throughout the brackish swamps of the Niger Delta in 1946 (Zeven, 1973). From these two points, the mangrove palm has colonized larger areas, particularly in brackish and sheltered tidal areas of Niger Delta as well as polluted bare soil where the dicotyledons of mangrove species are more commonly found (Sunderland and Morakinyo, 2002). The exposed mudflats of the mangrove forest of Nigeria are ideal colonization areas for *Nypa*, especially where the indigenous mangroves are unable to re-colonize. Currently the species has today colonized large areas of coastline throughout West Arica, (Figure 1).



Figure 1: *Nypa* palm in its natural habitat

Nypa fruticans is found in Nigeria in Bayelsa, Rivers, Akwa Ibom and Cross River States. It has invaded an estimated area of 821km² (Isebor *et al.*, 2003) where oil and gas exploration and other human activities have led to the interference in the normal mangrove. Again, lack of utilization by the local populace of this exotic mangrove species as in the Pacifics has increased the plants population over the years. It regards as weed that was introduced into the Southern part of Nigeria from Asia. Nypa Palm which is taking over the mangroves and is being cut down. Erroneously, today's key approach research is to stop the growth of this economic plant. The plants are repeatedly cut down in the Niger Delta, in order to ensure thorough eradication of the palm in the environment (David 2003 and NAN 2014).

Economic Importance of Nypa Palm

N. fruticans is a useful, versatile and fairly common component of mangrove forests of economic importance. Its productive usage value is one of the most visible for mangrove, its roles are quiet developmental, ecologically as a protection to the environment and economically as a natural resource. In other words, the mangrove palm has a high productive usage value with natural productivity.

The fossil palm has a host of local subsistence uses like medicines, hat, raincoats, roof material, for thatched houses, basketry, poles and as animal feed etc. The young Nypa shoots can be eaten as food, the petal of the flower brewed to make local tea and the immature fruits as a common ingredient in local desserts (Lawarence and Dennis, 1988; Ria Tan, 2001). Others are food sources and condiments, syrups and jams, etc. The potential value of this unique palm can lead to new management efforts and interest. Some important commercial uses include sap production to produce intoxicating beverage, sugar, vinegar, ethanol/alcohol that may be used as fuel. The young leaves are used to wrap tobacco for smoking. The palm's large amount of sap may allow for the production of 6,480-15,600 liters of ethanol per day per hectare. The hard shell (mesocarp) is successfully use in the making of buttons, necklaces and other fashion apparels in Nigeria (David 2003). Also, Nypa fronds are commomly used as sails by local fishermen.

Ecologically, *N. fruticans* enhances environmental sustainability. Its horizontal creeping stem stabilizes river banks preventing soil erosion. New fronds that emerge quickly after initial damage protect the soil after storms, erosion and also continuously produce useful products for the local dwellers. The colonization of Nypa on poor mangrove mitigates environmental challenges like climate change, global warming and sea water intrusion as well as coastal erosion which are the common problem of Nigeria coastline and Niger Delta in particular (Akpan and Gobo 2011). In case of deforestation of the ecosystem due to oil spillage, Nypa plays a significant role in conservation as it naturally colonized the area where the indigenious mangroves are unable to re-establish. The exotic and

opportunistic species of the Niger Delta prevent environmental degradation, and built up pond like structure of *Nypa* palm which makes a dramatic feature in ornamental lakes in tropical areas.

The Niger Delta ecosystem which is rich in biological diversity of flora and fauna is highly degraded by oil spill and industrial development. Oil spillage has a major impact on the ecosystem into which immense tracts of the mangrove forest which are susceptible to oil have been destroyed. The volatile, quickly penetrating, and viscous properties of petroleum have wiped out large area of vegetation (Fakpor *et al.*, 2006). The effects of petroleum spill on mangroves are known to acidify the soil, halt cellular respiration, and starve roots of vital oxygen (Okoh, 2001). Pollution of Niger Delta environment by oil has resulted in death of mangrove and lots of indigenous mangrove species.

It is well noted that any area of mangroves destroyed by oil, may be susceptible to other environmental problems; such area may not be suitable for any native plant growth. For instance, a particular species of mangrove, *Rhizophora racemosa* that abound in the Delta ecosystem cannot be supported by toxic acidified soils (Onietan, 2008). The potential effect on mangrove trees is the replacement of native mangrove like *Rhizophoraceae* and *Avicenniaceae* with *Nypa fruticans*. As the soil becomes unsupportive, invasive species of palm, *Nypa fruticans* quickly colonize the area (Orubite and Hamilton, 2005). In recent period, the exotic species of mangrove palm (*Nypa fruticans*) is replacing the native and pioneer mangroves especially along the polluted swamp and creeks of Rivers, Cross River and Ibeno in Akwa Ibom State.

Unlike most plants, the mangrove palm seeds are buoyant and can easily be dispersed by water. The seeds are viviparous having germinated while still attached to the parent tree. The germinated seedling grows out through the fruit to form a propagule which can produce its own food through photosynthesis. The mature propagule when dropped is transported by water to great distances. Propagules of this kind can survive desiccation and remain dormant for some times before arriving in a suitable environment. This is more likely to lodge in the mud and root. This characteristic gives *Nypa* palm an opportunity to reforest most mangrove areas in Niger Delta.

Nypa Fruticans thrives only in open disturbed mangrove forest. It does not thrive in closed undisturbed mangrove vegetation. Around Okirika, Andoni, Opobo and Calabar areas with bare mangrove soil and diluted estuarine where the *Rhizophora spp* have been over-cut by human activities, *Nypa* finds it very favorable to thrive, being a good light demander. The spread of *Nypa* palm can be related to the degradation of *Rhizophora spp* by human activity and crown opening of closed mangrove forest creating enough space (light) to encourage rapid growth and multiplication of *Nypa* suckers. As a result, the exotic and largely naturalized *Nypa fruticans* is replacing native mangroves especially the

Rhizophora species along most banks in the region (Onietan, 2008) that are being degraded. However, Bayelsa area where heavy spill occurred, over 6000ha mangrove forest plants and *Nypa* was wiped out due to higher concentration (level) of crude oil in the spill.

***Nypa Fruticans* as a Problem in Nigeria Mangrove Forest**

Studies indicate that *Nypa* is opportunistic species that has the potential to suppress and displace native mangrove species like *Rhizophora racemosa*. Within a period of about 100 years, *Nypa* has become the third most dominant species that expands up to about 45km from the sea shore to the hinterland of the Nigerian mangrove forest. Alternatively, the plant is known to be invasive species and its colonization has been considered to have negative influence on the ecosystem.

As an allelopathy plant as it suppresses other plants particularly the black and white mangroves (*Rhizophora*) (Sunderland and Morakinyo, 2002; Biopact, 2007; Kazeem, 2010), in Niger Delta. The exotic mangrove palm programme in Nigeria is said to be unsuccessful due to its poor resources utilization technology. It otherwise means that *Nypa fruticans* is under-utilized in Nigeria. Erroneously, the growth of *Nypa* plants in mangrove environment is pictured as an ecological problem and the plants are being cut down instead of use as a developmental product and reserved for the oil polluted mangrove environment and deforested regions.

Programmes are in top gear to eradicate *nypa* palm in Nigeria mangrove environment without proper thought of the adverse effect of the eradication programe on the mangrove ecosystem. Mangroves environment play a vital role in efforts to fight climate change and global warming (WRM, 2001 and Daily Independent, 2010). The natural ecosystem has a staggering ability to sequester carbon from the atmosphere, serve as both a source and repository for nutrients and sediments for the habitats, such as sea grass weeds and coral reefs (Hussin, 2008 and Daily Independent, 2010). As habitat that house biodiversity their loss can affect marine, fresh-water and terrestrial biodiversity much more widely (Akpan and Gobo, 2011). Degradation of the unique ecosystem has a considerable impact on biological diversity and the socio-economic activities as well as ecology of the environment. The resultant effect of most mangrove loss includes lost of biodiversity, poverty, unemployment, disputes, diseases, malnutrition and hunger, (WRM, 2009). The eradication of *nypa* palm from the Niger Delta mangrove ecozone may result in high coastal erosion, disruption of food chain, deforestation, poverty, climate change and global warming. Eradication plans of *nypa* should take into account ecological potential, productivity, sustainability and its implication on the mangrove ecosystem before it can be implemented.

Recommendation and Conclusion

Finally, *Nypa fruticans*, which has vastly colonized the coastline zone in Niger Delta is an endangered species in Singapore. This mangrove palms with such economic values if not substantially management and conserved, may soon be endangered or even extinct in Nigeria, due to lack of recognition of its importance and utilization. Since *N. fruticans* seems to thrive well on the highly polluted and depleted mangrove site of the ecozone, its restoration and utilization for commercial purposes should be explored before the species is finally endangered through non sustainable management processes and continuous reoccurrence of oil exploration and spillage. Again, local dwellers should be educated on the various uses of this mangrove palm locally to boost their income generation and reduce poverty in most oil producing communities whose environment are now altered by both Nypa palm and oil spillage. Before I rest my case, may I recommend exploration and use of nypa palm as a sustainable source of revenue in Nigeria as an alternative to crude oil in Niger Delta.

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