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Review on some selected angiosperm plants with special reference to Gondia District, Maharashtra

Kaisreen Matin Saiyed[1], Dr. Syed Shahab Ahmed[2]

[1]Research Scholar, Department of Botany,

Sri Satya Sai University of Technology &Medical Sciences, Sehore, M.P.

[2] Research Guide, Department of Botany,

Sri Satya Sai University of Technology &Medical Sciences, Sehore, M.P.

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Abstract:

Angiosperms are vascular plants with stems, roots, leaves etc. Angiosperms are the most advanced and practical group of plants. In various habitats, they can grow into bushes, trees, herbs, and shrubs. Angiosperms showed a wide range of characteristics. In this article; *Azadirachta indica* A.Juss., *Colocasia esculenta* (l.) schott, *Cryptocoryneretrospiralis* (Roxb.) Kunth, *Phoenix sylvestris* (L.) Roxbwere selected for review which are known as angiosperm plants and belongs to Gondia district, Maharashtra.

Keywords: Angiosperm, Plants, Gondia

INTRODUCTION:

The distinctive features of angiosperms are the presence of flowers at some point in the life cycle of every plant. The blooms are the plant's reproductive organs and a means of genetic information transmission. The sporophyte consists of three separate parts: stems, roots, and leaves. The vascular system is made up of true vessels and companion cells in the xylem and phloem, respectively. The stamens (microsporophyll) and carpels are the components of the flower (megasporophyll). Each microsporophyll has four microsporangia. The ovary houses the ovules at the megasporophyll's base. Because angiosperms produce both megaspores and microspores, they are heterosporous (pollen grains). One active megaspore is kept in the nucleus indefinitely. When pollen grains transfer from the anther to the stigma, reproduction occurs. They are responsible for passing on genetic information from one flower to the next. Pollen

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grains are considerably smaller than gametophytes, or reproductive cells, found in non-flowering plants. There are sporophytes that are diploid. The complex root system is made up of the cortex, xylem, phloem, and epidermis. The double and triple fusion of the flowers results in the formation of a triploid endosperm and a diploid zygote. The seeds of an angiosperm are found in flowers. They make up the great bulk of plants on Earth. In the plant's internal organs, the seeds develop into fruit. As a result, *Azadirachta indica* A.Juss., *Colocasia esculenta* (l.) schott, *Cryptocoryneretrospiralis* (Roxb.) Kunth, *Phoenix sylvestris* (L.) Roxbthey are often known as flowering plants. Here four angiosperms' plants were selected namely with special reference to Gondia district, Maharashtra.

REVIEW OF LITERATURE:

According to Vikash Sharma et al. (2018), neem is the most beneficial traditional medicine in Indian culture, as it is a source of various medicinal compounds and thrives in tropical and semi-tropical regions. Every component of the neem tree—including the bark, leaves, fruits, seeds, and extracts—is employed in indigenous systems of medicine. Its extracts have anti-inflammatory, anti-allergic, antiviral, antibacterial, antifungal, anthelmintic, and antiviral effects. In addition to these names, neem is also known as the "free tree of India," the "wonder tree," "Nature's drugstore," the "Divine tree," "heal all," and the "Panacea of All Diseases." In the present period, a particular focus should be placed on employing non-toxic herbal items to control diseases in both humans and animals. There is a tonne of potential for this miraculous plant to be used more effectively. [1]

Colocasia esculenta is a tropical plant cultivated largely for its delicious corms, roots, and vegetables, according to Rashmi D.R. et al. (2018). It is most commonly grown as taro and is frequently planted by small farmers in flood-prone locations with excessive rainfall. This study contains information on the physical characteristics of taro, its use as a food source, the region, and the growing season [2].

According to Pankaj Jain et al. (2018), the Phoenix sylvestris plant is indigenous to southern Pakistan and India and is known as Indian date. It has historical significance and is renowned around the globe for its nutritional benefits. It contains a wealth of nutrients, including

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carbohydrates, phenols, amino acids, flavonoids, tannins, alkaloids, terpenoids, dietary fibre, and vital vitamins and minerals. The plant's various sections each have unique medical qualities, including antipyretic, cardiotonic, laxative, diuretic, and antioxidant. The majority of the information that is currently available regarding the distribution, cultivation, phytochemical properties, Ayurvedic properties, ethno-pharmacological, medicinal, and non-medicinal uses of P. sylvestris over the past forty years has been attempted to be compiled in the current review. [3]

According to Wadkar SS et al. (2017), phytochemical screening and plant antibacterial activity are key factors that influence the isolation of new and innovative compounds. To find the various types of secondary metabolites, Cryptocoryne spiralis (Retz) Fischer ex Wydler var. spiralis (CSS) and Cryptocoryneretrospiralis (Roxb) Kunth (CR), leaf and rhizome, have been chosen for phytochemical screening. Various leaf and rhizome solvent extracts were tested for antibacterial activity using the agar-well diffusion method. The serial dilution approach was used to establish the minimum inhibitory concentration (MIC). With the use of these test organisms' growth patterns, the inhibitory effect was investigated. In order to ascertain the secondary metabolite profile, GC-MS analysis was also carried out. Active substances including alkaloids, coumarins, flavonoids, saponins, tannins, and glycosides were detected using phytochemical screening. Both the rhizome and the leaf of the two species of Cryptocoryne showed good antibacterial activity against Gram-positive bacteria when extracted with ethanol and methanol. In terms of its MIC (200 g/ml), an ethanolic extract of CSS rhizome was shown to have the best level of inhibitory efficacy against Micrococcus aureus (NCIM 2802) and Bacillus subtilis (NCIM 2045). This is mainly because the ethanolic extracts of the rhizomes of CSS and CR, respectively, include neomenthol, menthol, santalol, cis-alpha santalol, bicyclo (2, 2, 1) heptane, 2-methyl-3-methylene-2, 4-methyl-3-pentenyl-2, and 1S-exol. These extracts showed the presence of bioactive components known to have medical characteristics, suggesting that they could serve as potent sources of natural antimicrobials. [4]

Neem (Azadirachta indica) is a member of the Meliaceae family, according to Alzohairy M. A. (2016), and its role as a health-promoting effect is related to its abundant source of antioxidants. In the treatment and prevention of many ailments, it has been utilised extensively in Chinese,

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Ayurvedic, and Unani remedies around the world, particularly in the Indian Subcontinent. Neem and its constituents play a role in the scavenging of free radical production and the prevention of disease pathogenesis, according to earlier findings. According to research using animal models, neem and its main components play a crucial role in the management of cancer by modulating a number of molecular pathways, including p53, pTEN, NF-B, PI3K/Akt, Bcl-2, and VEGF. It is regarded as a safe therapeutic herb that modifies a variety of biological processes without causing any harm. In this paper, I give a brief overview of how Azadirachta indica affects many biochemical and physiological pathways to prevent and treat disorders. [5]

According to Ubalua AO et al. (2016), the southern regions of Nigeria were dominated by yam and taro from 1965 to 1980. Taro was the queen, and Yam was the king. At the time, they were the preferred staple food and were even offered to the gods. The introduction and domestication of the simple growers posed a threat to their acceptance and dominance (plantain, banana, maize, and later cassava, tannia, and sweet potato). The early mainstays were eventually superseded by the simple growers as they gained popularity and were recognized as staple meals. As a result, yam and taro were replaced by cassava and sweet potato, respectively. Compared to other root and tuber crops, taro provides a wider variety of vitamins and minerals. The future of taro as a significant crop faces enormous challenges due to the domestication of new crops that are comparably more productive and benefit from worldwide research and development clout. Consumer education and the nutritional and health benefits of taro should be the focus of any strategic choices for increasing production and consumption. A deeper understanding of the benefits the crop may provide for food security, health, and economic empowerment will result from more focus on taro study. The following section of the study examines some of the taro's health and nutritional advantages. Its contributions as an industrial crop will also be emphasised, with a focus on the difficulties Nigerian agriculture faces with the taro crop and potential solutions to improve the crop's sustainable production. [6]

According to T. Angami et al. (2015), morphological and chemical analysis were done as part of a study on varietal evaluation in taro for growth, yield, and quality features. All of the characteristics under study showed significant differences. "Panchmukhi" has the tallest plant (179.33 cm), the longest petiole (153.11 cm), the widest petiole (13.87 cm), the largest leaf

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(3095.67 cm2), the highest LAI (1.14 cm), the longest and widest corm (152.41 cm), the average corm weight (1500.00 g), and the highest corm output (20.00 t/ha). The maximum petiole number and cormel length reported by "C-3" were 15.00 (85.93mm). The cv. White Gouriya was found to have the highest cormel yield (15.29 t/ha), total yield (25.92 t/ha), and number of cormels per plant (30.33). 'ML-2' recorded the most side shots (7.33). Arcol-7 had the highest average cormel weight (72.85 g) and Arcol-5 had the highest cormel breadth (67.43 mm), but Nayabungalow had the lowest blight incidence percentage (8.00 %). In terms of biological components, "Nainital" had the highest total sugar content (5.85%), "Kandha-5" had the highest starch content (34.67%), and "Nadia Local" had the highest oxalic acid levels (1.05 mg/100 g). The cvs. KCA-1 and Panchmukhi had the highest dry matter content (27.50%), whereas "IG Coll-5" had the highest moisture percentage (82.83%). [7].

According to Patrcia R. Pereira et al. (2015), taro (Colocasia esculenta) is traditionally used as a medicinal plant and produces bioactive chemicals with significant biological capabilities. This is in addition to its nutritional value. The hemopoietic cells of C57BL/6 and BALB/c mice were used in this study to assess the protein extract from taro corms' immunomodulatory potential both in vitro and in vivo. In both mouse strains, the crude taro extract (CTE) enhanced the in vitro proliferation of mouse splenocytes in a dose-dependent fashion. Splenomegaly and the growth of all spleen and bone marrow cells were brought on by the intraperitoneal infusion of CTE. Additionally, CTE increased the number of B220+ splenocytes that proliferated in vivo, which was followed by a decrease in bone marrow levels of mature (B220+ IgM+) and immature (B220+ IgM) B cells. The generation of antibodies by B220+ splenocytes demonstrated that B1 cells were solely activated by CTE in C57BL/6. CTE is a potent source of immunostimulatory proteins, which have fresh possibilities for use as food and pharmaceutical industry additives. [8]

Date palm fruit (Phoenix sylvestrisL.) is edible and utilised as an anti-geriatric, anti-oxidant ethnomedicine, according to Das, R. et al. (2015) In this study, three different types of date extracts—methanolic, acidic, and basic ethanolic—were evaluated for their potential in vitro scavenging effects on reactive oxygen species (ROS). The scavenging of hydroxyl radicals, superoxide radicals, DPPH radicals, and nitric oxide (NO) was done in the following order: basic ethanolic>methanolic>basic ethanolic, acidic ethanolic>methanolic, and This powerful free

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radical scavenging activity was shown to be derived from their flavonoid and phenolic levels, which also showed a clear relationship with their overall antioxidant capacity. On bacterial lipopolysaccharide (LPS)-induced inflammation in human embryonic kidney cell line (HEK) and murine RAW macrophages, date extracts used therapeutically effectively reduce intracellular oxidative stress. It is likely that mitochondrial pathways are involved in this restoration of cellular equilibrium. [9]

Pseudomonas aeruginosa is widely documented for its capacity to develop biofilm on indwelling medical devices, according to Kusum Harjai et al. (2013). Due to these biofilms' strong resistance to standard antibiotics, they are challenging to eradicate. Therefore, it is necessary to search for alternative agents, such as medicinal herbs, that can efficiently eliminate or reduce biofilm. The effectiveness of neem in preventing P. aeruginosa from forming biofilms was examined in this study. The production of biofilms and the factors influencing them were also investigated. Results showed that neem leaf extract was very effective at preventing biofilm formation and structure. Exopolysaccharide, alginate, hydrophobic interactions, and uroepithelial cell attachment, which aid in the production of biofilms, were all severely impacted. The results support the usefulness of neem extract in preventing biofilm formation indwelling medical devices, according to Kusum Harjai et al. (2013). Due to these biofilms' strong resistance to standard antibiotics, they are challenging to eradicate. Therefore, it is necessary to search for alternative agents, such as medicinal herbs, that can efficiently eliminate or reduce biofilm. The effectiveness of neem in preventing P. aeruginosa from forming biofilms was examined in this study. The production of biofilms and the factors influencing them were also investigated. Results showed that neem leaf extract was very effective at preventing biofilm formation and structure. Exopolysaccharide, alginate, hydrophobic interactions, and uroepithelial cell attachment, which aid in the production of biofilms, were all severely impacted. The results support the usefulness of neem extract in preventing biofilm formation. Such research may result in the identification of risk-free antibacterial medicines derived from natural sources. [10]

According to Das, R. et al. (2013), four times in 2010—two in October and two in December—we saw Golden Langurs in Assam's Chirang Reserve Forest (26.300–26.520 N and 90.150–90.250 E) engaging in a unique eating behavior. The Chirang Reserve Forest is currently

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bordered on the south by National Highway 31, and it is bordered on the west by the Saralbhanga River, the river Bhur, the international border with Bhutan, and the north by the Saralbhanga River. The Manas Biosphere Reserve and Ripu-Chirang Elephant Reserve share a border with the Chirang Reserve Forest. In the Samukha River, we saw a group of Golden Langurs consuming Cryptocoryneretrospiralis (family: Araceae). The group consisted of 10 people in all, including 2 adult males, 5 adult females, 2 newborns, and 1 child. The langurs would travel to the river, pick up some of the plant, and eat it before continuing their journey. The duration of the feeding session ranged from two to three to five minutes. Langurs were observed aggressively searching for the plant on each of these four occasions. They would wait until a piece was selected and eaten while digging the plant in open stream beds. A direct and purposeful movement was made to the location. In eight instances, some of the plant material that had been taken up was tasted, odored, and then rejected. They ate the plant's stalks, leaves, and blossoms for food. A male once descended to the water to consume the entire plant (Image 1a). Among other aquatic macrophytes, they specifically prey on this particular plant species. The majority of the plant's consumers were adult males. [11]

According to Md. AlmujaddadeAlfasane et al. (2010), 80% of Cryptocoryne ciliate (Roxb.) Fisch, ex. Wydler, plants grown from seeds survive. The plant annually generated 4–8 new leaves, ranging in length from 45–52 cm, with summer showing the greatest elongation (1.04–0.21 cm/day) and monsoon showing the least (0.82–0.15 cm/day). Foliar components deteriorate in the winter and autumn. The conditions that promoted the most growth were 31.58 2.14 C water temperature, 12.74 0.53 hr day duration, and 776.83 107.21 E m -2 s -1 PAR. The soil's pH, moisture content, OC, OM, and CEC were 6.95, 29%, 2.16%, 3.72%, and 4.29 me/100 g, respectively. The plants thrived in the brown to blackish-brown, moist soils. There were 620, 3.09, 32, 370, and ppm of available nitrogen, phosphorus, potassium, and sulphur, respectively. [12]

An exploratory study was carried out in Chuadanga, a district in southwest Bangladesh, according to Md. Abdul Halim et al. (2008), to examine the current state and future potential of Khejur palm (Phoenix sylvestris Roxb.) husbandry in the rural economy. Using a semi-structured questionnaire, 36 households across three villages in the district were questioned. Based on the

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size of their land holdings, the farmers were divided into five groups: landless, marginal, small, medium, and large. The palm was dispersed over seven different geographic locations, with orchards providing the majority of its support (20%). The majority of the palms (29%) were managed by the landless category, which also owned the most palms (33%) and the fewest (4%). Ails and palms aged 7 to 14 years growing in agricultural settings produced the majority of the sap (2500 ml on average each night). The average seasonal income from palm products was highest for large category farmers (Taka 1: 38,135.00); however, landless farmers made up the largest proportion of that income (78%). If the farmers' indigenous technology was combined with more advanced management techniques, khejur palm husbandry may be a viable source of revenue for Bangladesh's rural areas. [13]

CONCLUSION:

Angiosperms may survive in a variety of habitats, including aquatic habitats. In angiosperms, fertilization occurs more quickly. The seeds are also produced quickly since the female reproductive components are smaller. All angiosperms contain stamens, the flower's reproductive organs. They produce the pollen grains that are genetically encoded. The carpels house the developing seeds that may mature into fruits. The production of endosperm is one of angiosperms' key advantages. The endosperm grows after fertilization and provides sustenance for the developing seed and seedling.

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