INTRODUCTION

Egypt is considered a poor country in wood production; therefore it imports large quantities of wood, charcoal and wood pulp to face the increasing local demand as a result of population explosion and to increase nation revenues **(El-Mallah and Kandeel, 1994)**. On the other hand, the scientists in many countries had made many researches on forest products to study the benefits of different trees and shrubs for the favorite of human society **(Abd-Eldaiem, 2004)**. *Jatropha curcas* L. (Euphorbiaceae), *Moringa oleifera* Lam. (Moringaceae) and *Phytolacca dioica* L. (Phytolaccaceae) are examples of these species which will be explained in literature review chapter.

J. curcas is a quick growing shrub which is distributed in tropical and subtropical parts of the world. It can be grown in low to high rainfall areas and can be used to reclaim land, as a hedge and/or a commercial crop. The plant produces many useful products, especially the seed from which oil can be extracted. Because it can be used in place of kerosene and diesel and as a substitute for fuel wood, it has been promoted to make rural areas self sufficient in fuels for cooking, lighting and motive power **(Openshaw, 2000)**. Many biologically active substances have been isolated and characterized from all parts of the plant and their molluscicidal, insecticidal and fungicidal properties have been demonstrated in lab scale experiments and field trials **(Gubitz *et al*., 1999)**.

Recently, *J. curcas* was cultivated in the Southern part of Egypt and irrigated by treated sewage water and the cultivation has been very successful. The next step consists in studying the best means of making use of this promising crop.

M. oleifera is an important, drought resistant tree introduced to Africa from India at the turn of the last century. It is found in most tropical countries (Africa, Asia and America). Numerous uses are recorded of all parts of the tree (multipurpose tree). *M. oleifera* (seeds, green pods and leaves) is a good source of vitamin A and C, also is rich of protein, fat, Ca, iron, copper and zinc **(Babu, 2000 and Lockett *et al*., 2000)**. The powdered seed extracts can be used in water purification **(Jahn, 1989)**. The wood has suitable characteristics for pulp, paper, cellophane and textile production **(Nautiyal and Venhataraman, 1987)**.

P. dioica belongs to family Phytolaccaceae which is chiefly tropical and subtropical family of trees, shrubs, woody climbers and herbs. *P. dioica* possess very rapid growth caused by anomalous secondary thickening **(Kirchoff and Fahn, 1984-b)**. It has many uses in medicine and dyes, as ornamentals, shade tree and potherbs **(Heywood, 1993)**.

For the best utilization of any raw material, it is necessary to know its physical nature and chemical composition. Variation in chemical constituents as well as fiber length and specific gravity influence the use of wood for various industries. In addition to its major components, cellulose, hemicelluloses, lignin, wood also contains small but in some cases quite appreciable quantities of extraneous components. In the literature, extractives are reported to extra diversified influence on the characteristics of wood, wood products and tissues. They are responsible for color and fungicidal characteristics in wood **(Badran and El-Osta, 1977)**.

To use the selected trees plantations as raw materials, more research on its wood properties is needed to determine the suitability for specific products or any extended uses. Specific

gravity and fiber length have been selected by tree breeders and wood researchers to classify tree quality because of their strong relationship with wood substances **(Vudru and Bensend, 1979 and Kandeel *et al*., 1988)**.

In Egypt the studies on these three species are very limited. This work is a starting effort to characterize the wood properties (physical, chemical and anatomical) of these species. Therefore the objectives of this study are to:

- determine the variation of the specific gravity of *J. curcas, M. oleifera* and *P. dioica* woods.
- analyze the chemical properties (cellulose, hemicelluloses, lignin and extraneous contents %) for woods of the selected species.
- measure the fiber morphology (fiber length, lumen diameter and cell wall thickness) of woods.
- study the anatomical features among cross, radial and tangential sections of stem's wood in the three studied species.