

# **WATER-SOLUBLE EXTRACT OF EURYCOMA LONGIFOLIA JACK AS A POTENTIAL NATURAL ENERGIZER FOR HEALTHY AGING IN MEN.**

**M.I.M.TAMBI<sub>1</sub> and J.M SAAD<sub>2</sub>,**

*1Specialist Reproductive Research Center, National Population & Family Development Board, Ministry of Women & Family Development, Malaysia.*

*2Department of Biochemistry, Faculty of Medicine, University of Malaya, Malaysia.*

**First Asian Andrology Forum in Shanghai China 2002**

**Asian Society of Sexology Conference in Singapore, December 2002**

## **INTRODUCTION**

Malaysia has a rich source of rainforests that contain thousands of plants with potential medicinal values. One of such plant is the tall shrub tree from the Simaroubaceae family, *Eurycoma Longifolia* jack which is commonly found along the hilly jungle slopes of Malaysia (Burkill and Hanif,1930). The local name of the shrub is 'Tongkat Ali' or Ali's Walking Stick' which is rather suggestive of its traditional function and that is to give support to aging males. Similar trees are also found in other Asian Rainforests, however it is traditionally known that only two species of the shrub namely *E.Longifolia* and *E.apiculata* have medicinal properties (Burkill and Hanif,1930). It is interesting to note that the medicinal elements are found in the roots. The root of *Eurycoma Longifolia* were used as a decoction by the natives of old Malaya, especially the elderly, for strength and energy (Burkill and Hanif,1930) and it is inspiring to know that this practice still remains to this day.

Early experimental studies on animals were mainly focused on the aphrodisiac properties of *E. Longifolia*. Mice treated with LJ100 *E. Longifolia* extract demonstrated higher frequency of mounting compared to the control group (Ali and Saad,1993). The serum testosterone of the dissected mice showed an increase of 480% (Ali and Saad,1993). Further study on this provided evidence that *E. Longifolia* Jack produced a dose-dependent increase in mounting frequency in male rats, hence acting as a potent stimulator of sexual arousal in the absence of feedback from genital sensation (Ang and Sim,1997). It was also shown that *E. Longifolia* enhance and maintain a high level of both the total number of crossovers, mountings, intromissions and ejaculations.

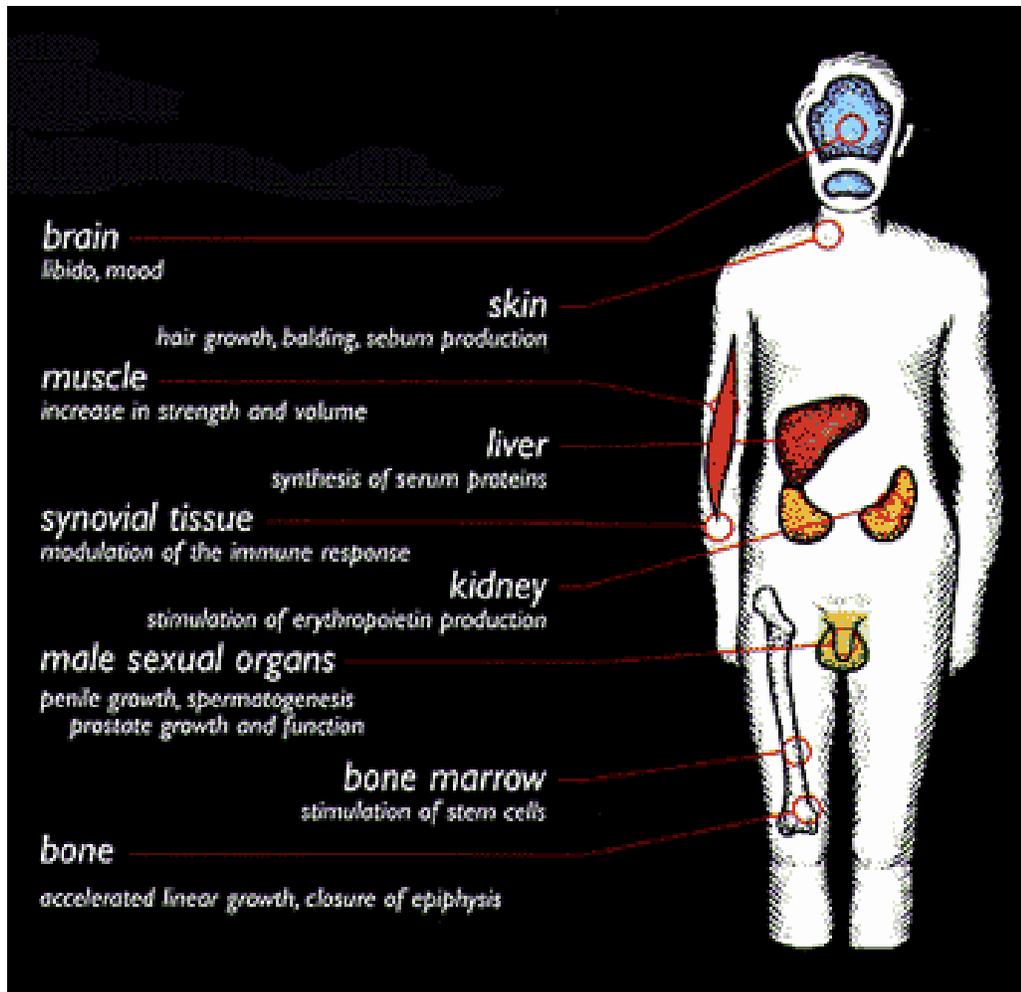
Other studies showed that when the extract of *E.Longifolia* root was injected into male mice, they showed intense physical activities and copulatory behaviour (Ang and Sim, 1998[1]). Even frail mice were observed to be active and alert and there was increase of body metabolism (Ang and Sim, 1998[2]). Water-soluble fraction of *E. Longifolia* extract

were exposed to penile muscular tissue of male mice and the muscular tissue were found to relax. Analysis on the mitochondria homogenates of the liver and penile muscle of the mice showed that LJ100 extract could enhance the respiration of mitochondria, leading to 60% increase in ATP production through oxidative phosphorylation (Khamis and Saad,1993). These provide evidence that this plant is a potential natural energizer for men.

Early trial on human were on the testicular tissues where LJ100 extract were incubated along with human testicular tissues taken from men who were orchidectomised as part of treatment of prostate cancer (Aminuddin et al,1995). There was significant increase in the concentration of testosterone and its precursors. The results obtained suggest that LJ100 has the ability to increase the biosynthesis of androgens (Aminuddin et al,1995).

Andropause is associated with low (bioavailable) testosterone levels. Andropause, also called Male menopause, hypogonadism, and somatopause, occurs in men are between the ages of 40 and 55. Starting at about age 30, testosterone levels drop by about 10 percent every decade. At the same time, Sex Binding Hormone Globulin, or SHBG, is increasing. SHBG traps much of the testosterone that is still circulating and makes it unavailable to exert its effects in the body's tissues. What's left over does the beneficial work and is known as "bioavailable" testosterone.

Testosterone, or male sex hormone, plays a key role in developing and maintaining masculine sexual organ, and promotes secondary sexual characteristics, including the appearance of facial hair, sexual desire, and sexual behavior. Testosterone stimulates metabolism, which promote fat burning, and accelerates muscle growth. Testosterone helps to build protein and is essential for normal sexual behavior and producing erections. It also affects many metabolic activities such as production of blood cells in the bone marrow, bone formation, lipid metabolism, carbohydrate metabolism, liver function and prostate gland growth.



Low Bioavailable Testosterone can lead to low sex drive, emotional, psychological and behavioral changes, decreased muscle mass, loss of muscle strength, increased upper and central body fat, Osteoporosis and increased cardiovascular risk.

In this study, we intend to investigate the effect of LJ100 on Andropause. We will evaluate the testosterone, DHEA and SHBG levels in human subjects. We also intend to study the Quality Of Life (QOL) events of the individuals who are taking the extract through PADAM (Partial Androgen Deficiency Among Aging Men) score and Sexual Health Inventory Questionnaires.

## **METHODOLOGY**

In a Reproductive Research Center in Kuala Lumpur, Malaysia, 30 human volunteers were recruited in a randomized open trial. The volunteers were selected among married men whose age ranges between 31-52 years. Apart from this, there were no other specific criteria for the selection of volunteers. LJ100, a freeze-dried standardized E.Longifolia

extract (22% Bioactive Eurypeptides) was produced by Dr. Johari M. Saad and co-workers from the Department of Biochemistry, University Malaya, Malaysia, utilizing a proprietary BAT procedure.

Upon registration, the volunteers were asked to fill out two questionnaires: (i) a validated Sexual Health Inventory Questionnaires (SHIQ) and (ii) the PADAM Score Questionnaires. Peripheral venous blood sample was collected from each individual to evaluate his total testosterone hormone, dehydroepiandrosterone sulphate (DHEA) and sex hormone binding globulin (SHBG) levels. Following this, each volunteer was given a supply of the encapsulated LJ100. These were to be consumed regularly for three consecutive weeks, twice daily, and two capsules per day.

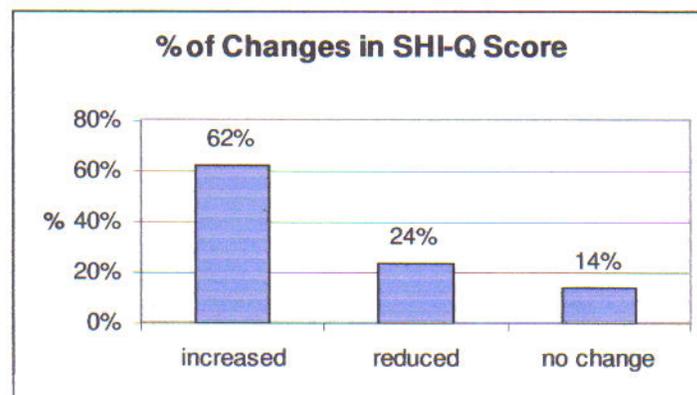
The volunteers were requested to come for follow-up after week one and week three. During the follow-up sessions they were asked to again fill out two sets of questionnaires and provide blood samples for analysis of follow-up serum testosterone, SHBG and DHEAS. These results were tabulated and analyzed accordingly.

## **RESULTS AND DISCUSSION**

### **Analysis of the Questionnaires**

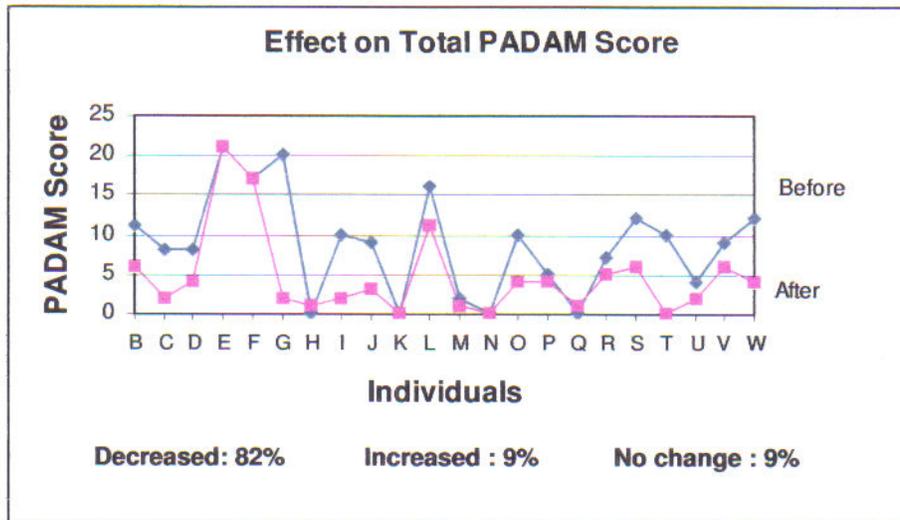
Analysis of the SHI-Questionnaire results have shown that 62% of the cases had either increased or maximum score after consuming LJ100. Another 24% showed reduction while 14% of the cases showed no change in the score. This indicates that the majority of the volunteers demonstrated an increase in their satisfaction in their sexual health and performance. Breakdown of the SHI-Questionnaire showed increase in the sexual desire and the success in the attempts at sexual intercourse while on treatment and relate very well with the PADAM Score, that is improvement in sexual attempts and sexual desire.

**Figure 1: Effect of *E. Longifolia* consumption on SHI Score**

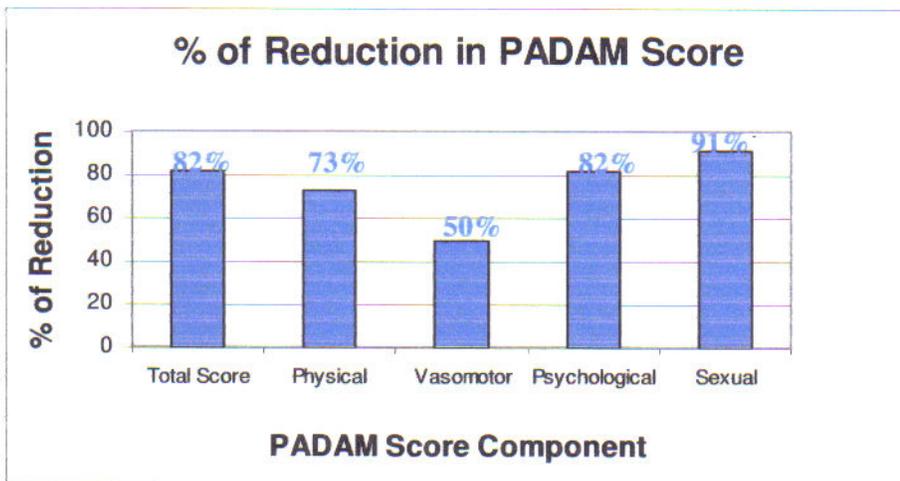


Analysis of the PADAM Score demonstrated that 82% of the cases showed a decrease in the total score. There is 91% improvement of Sexual component of PADAM Score, 73% improvement in Physical component and 82% improvement of Psychological component of PADAM Score. The Vasomotor score showed improvement in 50% of the subjects. The improvements of first three components of the PADAM Score reflects that consumption of LJ100 had resulted in improvement of their quality of life with regards to their physical, sexual and psychological well being.

**Figure 2: Effect of LJ100 consumption on Total PADAM Score**



**Figure 3 : Percentage of Reduction for Various Components of the PADAM Score**



### **Analysis of the Serum Hormones**

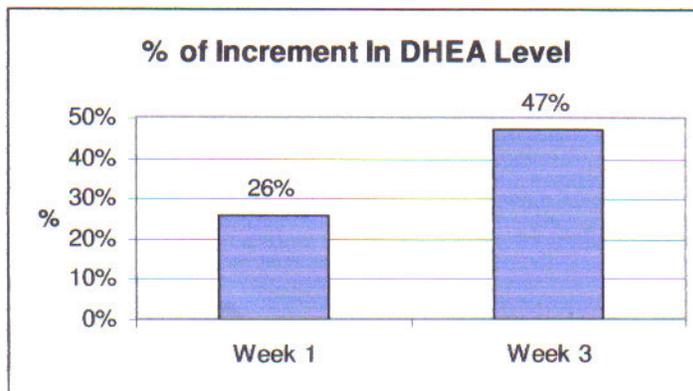
The total testosterone levels were not significantly different between those raised (43%) and those declined (39%) in the subjects in this study. This gives an initial impression that LJ100 does not have any effect on steroidogenesis. Considering that almost all the volunteers have basically normal levels of total testosterone, the feedback system is activated to ensure the testosterone levels are within the individual needs range. In 6 volunteers whose serum total testosterone is low there is increase in total testosterone on first and third week as well as improvement in the Quality of Life Scores(SHI-Q and PADAM Score) .

**Table 1: Results of Total Testosterone Analysis**

| Duration of usage | Increased level | Decreased level | No change in level |
|-------------------|-----------------|-----------------|--------------------|
| After 1 week      | 43 %            | 52 %            | 5 %                |
| After 3 weeks     | 40 %            | 53 %            | 7 %                |

Analysis of the DHEA showed gradual increase in the level from 26% after 1 week to 47% after 3 weeks. This suggests that the extract may influence the DHEA production, which would in turn subsequently be aromatized to testosterone.

**Figure 4: Percentage of Increment in DHEA level**

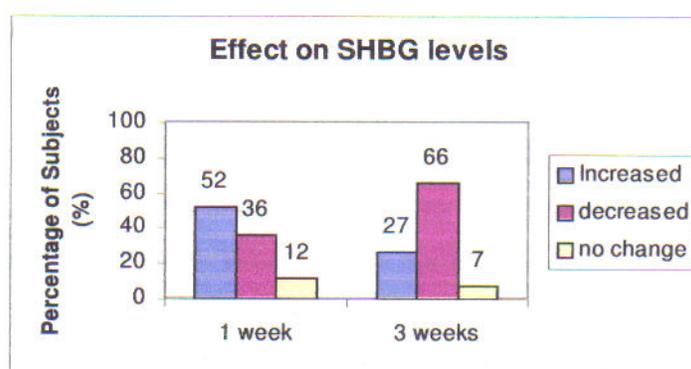


The SHBG analysis showed more interesting and essential results. It was found that the levels were reduced in 36% of the cases after one week. The reduction went up to 66% after 3 weeks. This may suggest that the extract could have an effect on the production of SHBG.

**Table 2: Results of SHBG Analysis**

|               | Increased level | Decreased level | No change in level |
|---------------|-----------------|-----------------|--------------------|
| After 1 week  | 52 %            | 36 %            | 12 %               |
| After 3 weeks | 27 %            | 66 %            | 7 %                |

**Figure 5: Effect on the SHBG levels Effect on SHBG**

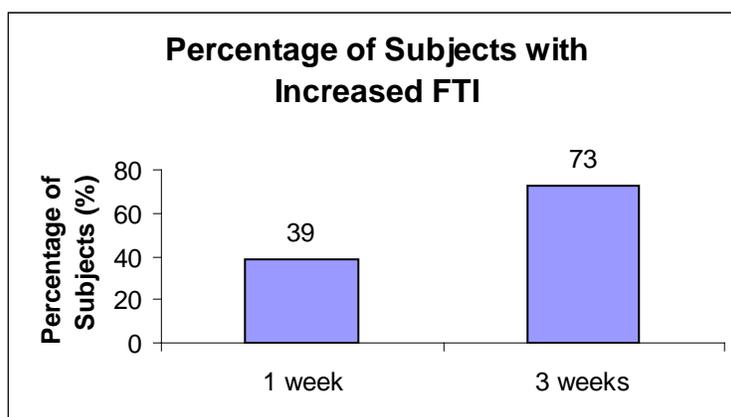


Consequently, when the SHBG level declines, the Free Testosterone Index (FTI) is calculated as a percentage of the total testosterone against SHBG) goes up. This is therefore reflected in the FTI analysis, which appears to escalate in 39% of the subjects after 1 week to 73% after 3 weeks.

**Table 3 : Analysis of the Free Testosterone Index (FTI)**

| Duration of usage | Increased level | Decreased level | No change in level |
|-------------------|-----------------|-----------------|--------------------|
| After 1 week      | 39 %            | 52 %            | 9 %                |
| After 3 weeks     | 73 %            | 27 %            | 0 %                |

**Figure 6: Comparison of the Percentage of Subjects with Increased FTI Between 1 week and 3 weeks of Study.**



## CONCLUSIONS

LJ100 (22% Bioactive Eurypeptides) has strong potential in treating andropause by providing sufficient free testosterone to the body as demonstrated by the increase in the free testosterone index and decrease SHBG level of volunteers who were on the extract at one and three weeks. When this is translated to The Quality Of Life Scores of PADAM and SHI-Q, a high score is seen in the Physical and Sexual Domain of PADAM Score as well as in the Desire and Sexual Attempts in the SHI-Q Score. Males in general and elderly men in particular would find this specific extract valuable as a health elixir to keep them on the move. This extract will sure be their trusted walking stick as they pass their old age.

Since this study is just an exploratory study to look into the marketing potential of LJ100 (22% Bioactive Eurypeptides), the volunteers were asked about personal feedbacks with regard to the extract.

The following responses were received:

48% felt that they are feeling healthy, not easily tired, feeling active and energized.

40% felt easily aroused, increase sexual desire, can maintain erection longer and able to achieve more climaxes during sexual intercourse.

16% felt their joints and backache are feeling better.

24% felt warm and easily sweat (sigh of goodness !)

8% experience good sleep.

8% felt their memory is good.

20% felt their appetite has improve and their bowel movements are better than before.

There are however some negative feedbacks with regards to the herbal extract and these are as follows:-

12% complained of constipation and dryness of throat.

8% found that their erectile problems are not resolved

4% complained of feeling sleepy

12% did not feel any changes at all.

It is felt that more study on human subjects need to be done to uncover its potential.

## REFERENCES

1. Burkill, IH and Hanif, M; (1930) Malay Village Medicine, The Garden Bulletin Strait Settlements.
2. Ali, JM and Saad, JM (1993); Biochemical effect of Eurycoma Longifolia Jack on the sexual behavior, fertility, sex hormone and glycolysis. Dissertation Paper for Bachelor of Science, Department of Biochemistry, University of Malaya.
3. Ang, HH and Sim, MK (1997); Effect of Eurycoma Longifolia Jack on sexual behavior of male rats. Archives of Pharmacal Research (Seoul), 20(5), 656-58
4. Ang, HH and Sim, MK (1998)[1]; Eurycoma Longifolia Jack and orientation in sexually experiences male rats. Biol and Pharmaceutical Bulletin 21(2); 153-55
5. Ang, HH and Sim, MK (1998)[2]; Eurycoma Longifolia Jack increases sexual motivation in sexually naive male rats. Archives of Pharmacal Research (Seoul), 21(6), 778-81
6. Khamis, ZM and Saad, JM (1993); Dissertation Paper for Bachelor of Science, Department of Biochemistry, University of Malaya.
7. Aminuddin, N; Saad, JM; Hadi, AH and Abdullah, R (1995); The effect of Eurycoma Longifolia extracts on androgen synthesis.