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ORIGINAL ARTICLES

The Present-day Survey of Registered and Standardized Herbal Medicines in Jordanian Pharmaceutical Market

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Mohammad S. Abu-darwish, Ezz AL-Dein Al-Ramamneh: The Present-day Survey of Registered and Standardized Herbal Medicines in Jordanian Pharmaceutical Market

ABSTRACT

A survey study of present-day registered and standardized herbal medicines (RSHM) was conducted during the first half of 2008 in the Hashemite Kingdom of Jordan. The study covered selected markets of RSHM including 20 pharmaceutical factories, 30 drug stores, and 100 pharmacies in the Jordanian pharmaceutical market (JPM). Additional information were also obtained from archives of the ministry of health and Jordan drug and food administration (JFDA). The survey yielded information on many and varied RSHM presented in JPM which are form only 0.82% of all drugs registered in Hashemite Kingdom of Jordan. 32.6% of RSHM in the country are produced locally. 36.95% RSHM were used in Jordan are those containing essential oils as the main active ingredients**.** The results of this study indicated that Jordan has a limited and non well-developed trade market of registered and standard herbal medicines compared with synthetic drugs.

Key words: Biological active compounds, Herbal medicine, Jordan, Pharmaceutical market, synthetic drug.

Introduction

Various natural materials as sources of medicines have been used in Jordan throughout ancient times. Jordan like its neighbouring countries has been distinguished throughout history by a rich inventory of natural medicinal substances. Among the chief reasons for this, first is the kingdom's location, at a meeting point of three continents, and its special climate, influenced by the Mediterranean as a moderating factor and the desert as a drying factor (Al-Eisawi, 1996).

In Jordan, medicinal plants increasingly play an important role in folk medicine (Al-Khalil, 1995; Abu-Hamdah, 2000; Abu-Rmailah and Afifi 2000; Aburjai *et al*, 2007). Although modern medicine may be available in this country, herbal medicines have often maintained popularity for historical and cultural reasons. Concurrently, many people in developed countries have begun to turn to alternative or complementary therapies, including medicinal herbs (Al-Khalil, 1995; WHO 1991 and 1999). On the other hand, several conferences and workshops were held dealing with the call to return to nature (Duke, 1985; WHO, 1993; Haggag, 2004; Gilani, 2004; Bahreininejad and Bagherzadeh, 2004). This has changed the attitude of many people to use the more safe drugs derived from nature rather than using synthetic drugs which have more side effects. Jordanian pharmaceutical industry continues developing products to cope with the updated national drug policy of Jordan. This may increase the competitive ability between the local industry and world marketing of drugs in the local market. Thus, 20 pharmaceutical factories are now established in Jordan (Hammad *et al*.1999; Abu-Rmailah and Afifi 2000; Alsbool, 2005).Strikingly, even in most developing countries, the herbal medicines market is poorly regulated, and herbal products are often neither registered nor controlled (Abu-Hamdah, 2000; Efrain and Amre, 2002).

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Quality, efficacy, and assurance of the safety of medicinal plants and herbal products has now become a key issue in industrialized and in developing countries. Both general consumer and health-care professionals need up-to-date and authoritative information on the quantity, quality, safety and efficacy of medicinal plants and their preparations. (Tyler, 1994; Tyler *et al.*, 1998). Therefore, this study was designed to determine the ratio of RSHM in Jordanian pharmaceutical market (JPM) and their percentages in comparison to both local and imported synthetic drugs.

Materials and methods

This study was carried out during the first half of 2008. 20 pharmaceutical factories, 30 drug stores, and 100 privet pharmacies throughout Jordan were screened twice. Of these, 18 factories, 30 drug stores and 50 pharmacies were visited in Amman, 10 pharmacies in Irbid, 10 pharmacies in Al-Zarqa', 3 pharmacies in Al Mafraq, 3 pharmacies in Al-Salt, 5 pharmacies in Ajloun, 2 5 pharmacies in Madaba, 5 pharmacies in Ma'an, 5 pharmacies in Tafilah and 5 pharmacies in Aqaba.

Information was also collected from archives of the Ministry of Health, Jordan Food and Drug Administration (JFDA, 2008) and the Jordanian Pharmacists Association. These include trade names, pharmaceutical forms, the main biological active compounds, therapeutic indications and the manufacturing companies of RSHM (Table 1). This survey did not include multivitamin drugs containing herbal extracts and herbal tea.

Results and Discussion

According to the JFDA and the data available in literature, the number of all drugs registered in Jordan is 5617 items (Mohammad *et al*. 2002). The numbers of all medicines which are produced by the Jordanian pharmaceutical Companies (JPC) are about 2311 items. These medicines belong to various chemical and pharmacological groups**.** As shown in figure (1), 41.15% of the total medicines registered in Jordan are produced locally by JPC, whereas the percentage of imported medicines is 58.85%. In 2008 all medicines produced in Jordan increased by 0.71% compared with the results of 2007 (Abu-darwish, 2008), it is noticed that. The trend of the JPC has been influenced in the last years by the change in the policy of international pharmaceutical industry that aimed at producing drugs from their natural resources and herbs (WHO 1993; Ministry of Health, 2002).

The percentage of RSHM to all drugs registered in Jordan is 0.82%. Synthetic medicines in various pharmaceutical forms produced by the JPC were 154 times more than those produced from herbal origins (2311:15). Furthermore, as shown in Table 1 and Figure 2, the percentage of RSHM produced by JPC is 32.6% whereas the imported RSHM is 67.4%.The obtained data indicate arise in the RSHM produced by JPC Index by 3.6 % during the first half of 2008 as compared with 2007 year. (Abu-darwish, 2008).These results were in agreement with results obtained by Jordanian department of statistics which indicated an increase in the General Industrial Production Index in June 2008 by 0.3 % compared with the same period of 2007. (Dos, 2008).

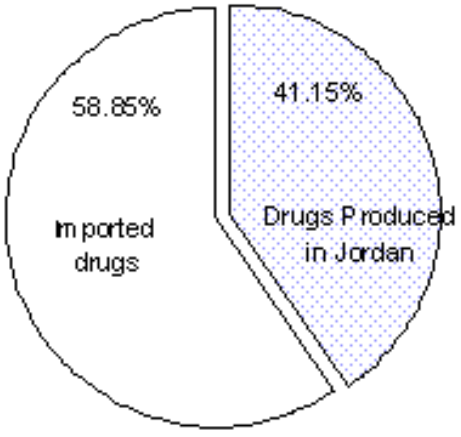

Fig. 1: Percentages of produced and imported medicines in JPM.

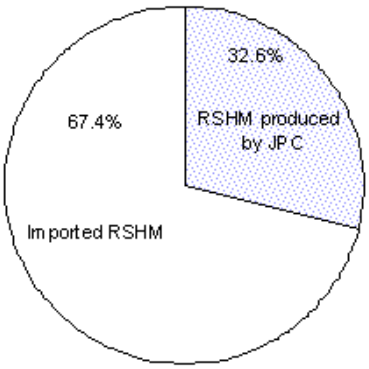

Fig. 2: Percentage of RSHM produced by JPC to imported RSHM.

Table 1: Registered and standardized herbal medicines(RSHM) in the Jordanian pharmaceutical market(JPM) at the first half of 2008.

Trade name	Pharmaceutical form	Active Igredients	The Biologicalative Compounds	Therapeutic indictions	Manufacturing company
Althym®	Syrup	Althaea officinalis fluidextract (0,5%), Thymus vulgaris fluid extract	Essential oils.	Anti cough and mucolytic	Gricar srl.
Apple-lite®	Tablets	Each tablet contains: Apple fibres 500mg (from-apple cuticle). Pure apple gel pectin 50mg (form apple pulp).	Polysaccharides	Helps to suppress appetite by giving a pleasant feeling of fullness. It is indicated in cases of: - Obesity - Weight loss programs.	Mepaco Egypt.
Bekunis®	Tablets	Each tablet contain: 150-220mg dry extract from tinnevelly senna pods, corresponding to 20 mg hydroxyanthracene derivatives calculated as sennoside B.	Antraquinones.	Used for short-term in cases of constipation .	Roha arzneimittel GmbH . Germany .
Bilichol®	Soft Gelatine	Essential oils.	Each Gelatine capsule contains: Menthol 32mg Menthone 6 mg Pinene (α+β) 17mg Borneol 5mg Cineole 2mg Camphene 5mg	For the treatment of hepato-biliary disorders including dyskinesia of bile ducts, biliary stasis, inflammatory biliary conditions, cholecystitis and cholelithiasis.	Pharco Pharmaceuticals Egypt.
Bran®	Capsules	Each capsule contains: Bran (treated) 400mg	Polysaccharides	Used to manage the gastrointestinal disorders and also for control of weight.	Mepaco Egypt.
Bronchicum®	Elixir	100mL of solution contain grindelia herb tincture (1:5) 1mL, pimpinella root tincture (1:5) 0.2mL, primula root tincture (1;5) 0.5mL, quebracho bark tinecture (1:5)0.7mL, tincture of thyme (1:5) 1mL	Essential oils, gum, saponins.	Paraxysmal, cough inflammation of the bronchi and their obstruction with mucous.	Engelhard Arznemittel. Germany.
Cyclo3fort®	Capsules	Each capsule contains: - Extract of Ruscus aculeatus at 22% of sterolic hetrosides 150mg Hesperidin methyl Chalcone 150mg Ascorbic acid 100mg.	Flavonoids	It is avenotonic and vasculoprotector. It is indicated for treatment of: symptoms related to venolymphatic insufficiency and treatment of metrorrhagia related to micro progestoron contracepation.	Pieere Fabre Medicament. France.

Table 1: Continue,

Daflon ®	Tablet	Each film-coated tablet contains: Micronized purified flavonoid Fraction corresponding to: . Diosmin: 90% . Flavonoids expressed as hesperidin: 10%.	Flavonoids	It is avenotonic and avasculoprotector. It is recommended for treating venous circulation disorders and for treating symptoms due to acute haemorrhoidal attack.	Les-Laboratories Servier France.
Diet ness plus	Tablet	Each tablet contains: Garcinia quaesita 2400mg, Gymnema sylvestr 50mg, Dandelion root 50mg, Horsetail 40mg, Juniper berries 50 mg, Klep 20 mg,.	Fruit acids	It is used for weight's controlling and obesity.	Vitex Switzerland
Diosper®	Film coated tablets	Each tablet contain diosmine 450mg hesperidine 50mg	flavonoides	It is avenotonic avasculoprotector. It is recommended for treating venous circulation disorders and for treating symptoms due to acute haemorrhoidal attack.	Kleva Ltd Greece
Echimmune®	Syrp and tablets	Each medicine contains extract ratio of dried pressed juice of Echinacea purpurea herb 45:1	phytosterols	Used to boost the immune system, increased production and activity of lymphocytes, increase level of circulating neutrophils.	Delass Jordan
Flatam-Plus®	Tablets Drops	Each tablet contains 100mg of Carum carvi dry seed extract and 100mg of Feoniculum vulgare dry seed extract. Drops contain: foeniculum vulgare dry seed extract 1.0% Carum Carvi natural dry seed extract 0,5%.	Essential oils	Helps relieve gastrointestinal complaints and expels gases causing flatulance.	DEASS Natural products Jordan.
Garslim®	Tablets	Each tablet contains: 500mg Garcinia Cambogia extrat standarized to contain 50% hydroxy citric acid.	Fruit acids	It is used for weight's controlling and obesity.	DELASS Jordan.
Gincata®	Tablet	Each tablet contains 120mg of Ginkgo biloba dry leef extract corsponding to 24% Ginko flavon glycosides and 6% Ginko terpenlactons.	Flavonoides	Helps in the following conditions: -Declining mental capacity. -Arthritic and rheumatic problems. -Body coldness -Tinnitus -Alzheimers and senility. -Antioxidant.	DELASS natural Products Jordan.
Gincosan®	Capsules	Each Capsule contains: Standardized Ginkgo biloba extract GK501. 60mg adjusted to 24% ginkgo-flavone-glycosides. Standardized panak ginseng C.A. Meyer extract G115 100mg adjusted to 4% ginsenosides.	Flavonoides and Saponines.	It is used in case of declining mentel capacity, lack of concentration and attention, poor memory changing mood and difficulties of adaptation and contact.	Pharmaton Switzerland
Ginger®	Tablets	Each tablet contains: Powdered Ginger (Zingiber officinale) 400mg.	Essential oils.	It is indicated for:- -morning sickness Postoperative nausea. -Dys menorrhea. -Cold, headach and migrine.	MEPACO Egypt.

Table 1: Continue,

Ginkgo Max®	Caplets	Each caplet contains: Ginkgo biloba leaf 2.000mg. 40mg of 1:50 extract standardized to 24% flavoglycosides. 10%quercetin.	Flavonoides	It is used in case of declining mentel capacity, lack of concentration and attention, poor memory, changing mood and difficulties of adaptation and contact.	Jamieson laboratories, Toronto, Montoreal Canda.
Ginso® 500	Capsules	Each capsule contains 100mg of standarized dry extract of Ginseng root.	Saponins (gensinosides).	To improve physical and psychogenic status.	Tabuk pharmace utical manfacturing co.
Hederal®	Syrup and suppositories	Each 5ml of HEDERAL Syrup contain: 37 mg Hedera helix dry leaf extract. Standarized to contain a minimum of 10% hedracoside C. -Each HEDERAL suppository contain: 80 mg Hedera helix.	Glycosidic saponin (such as hederacoside C).	Helps relieve symptoms associated with the following: *Bronchial asthma and chronic obstructive pulmonary diseases. *Catarrhs of the respiratory passages, especially chronic catarrh.	DELASS natural products Jordan.
I V Y®	Syrup	Each 5ml contains:Ivy leaf extract (10% hederacoside C) 37mg.	Glycosidic saponin (such as hederacoside C)	For treating acute catarrh of respiratory tract accompanied by coughing.	JOSWE
JOS-PAN®	Syrup	3.75 mg Hederacoside C).	Glycosidic saponins such as Hedracoside C	To treat the acute catarrh of the respiratory tract accompanied by coughing; symptomatic treatment of chronic inflammatory bronchial disease.	JERASH Jordan.
LAXAL®	Tablet	Each tablet contains calcium salts of purifed senna extratct (equivalnt to 12mg of sennosides).	Anthraquinons, sennoside A and B.	Atonic constipation	Julphar U.A.E.
MEBO®	Ointment	It is natural and herbal edible origin, composed of 0.25% β - Sitosterol, 18 aminoacid, 4 fatty acids, vitamin.	β- sitosterol, aminoacids and vitamins	For first and second degree of burns, chronic wound, cracked heels and nipples.	Julphar U.A.E.
Melrosum®	Syrup	100ML of solution contain: Tinc. Herb. Grindeliae (1:5) 0.2 ML. Tinc.Rad. Pimpinellae (1:5) 0,2 ML. Tinc.Rad. Primulae 1 ML. Tinc Herb thymi (1:5) 1.2ML Tinc.Flor. Rosae (1:5) 1 ML.	Essential oils.	Catarrhal conditions of the respiratory tract, especially in sensitive patients, children and pregnant women.	NATTERMANN Germany.
NERVELAX®	Capsules	Each capsule contains Hypericum perforatum dry extract 300mg standardized to contain Hypericin 0.9 mg.	Anthraquinones	The therapeutic use of Hypericum extract are depressive states and psycho-vegetative disorders as well as anxiety and nervous agitation.	JOSWE medical Jordan.
Odourless Garlic®	Capsules	Each capsule contains: Garlic powder 5 mg (Allium sativum, bulb, 100:1 extract, equivalent to 500mg fresh garlic).	Essential oils and saponins.	It is indicated to help improve blood circulation and tissue perfusion. It has antiviral, antifungal and bactericidal effect.	Jamiesson Laboratotion Canada.
Pepon®	Capsules	Each capsule contain: pumpkin seed oil 300mg	Vitamines, minirals.	For the relief of symptoms occuring in the early stages of prostatic hyoerplasia.	MEPACO Egypt.
PILKA®	Drops	1ml contains 80mg of thyme extract, pinguicula (butterwort) and drosera (sundew), 1.9mg of thym essence.	Essential oils.	Antitussiv, expoctorant to treat cough associated with colds.	Novartis Consumer Health.

Table 1: Continue,

Pollen-Forte®	Capsules	Each capsule contains: Pollen grains extract 200mg enzymes and fattay Ginseng dry extract 50mg Black seed (treated) 100mg.	Vitamins, aminoacids, acids.	It is indicated. .for post operative periods for supportive treatment for griatrics. In cases of Anorexia, malnutrion and stress conditions.	MEPACO Egypt.
POLLJUVEN®	Capsule	Each capsule contains 290mg pure, naturally fermented and fully membrane-cracked pollen form different flowers	Sugers, Protins, Fats, and amino acids.	To improve concentration and mental capacity.	Diaform Ltd Switzerland
PROSPAN®	Syrup	100ml of solution contain 0.7g of dried Ivy (Hedra salix) leaf extract (5-7.5:1) .	Glycosidic saponins such as Hedracoside C	To treat the acute catarrh of the respiratory tract accompanied by coughing; symptomatic treatment of chronic inflammatory bronchial disease.	Engelhard Arznemittel Germany.
PROSTATO NIN®	Capsules	Each capsule contains: Standardized pygeum africanum extract 25mg Standardized Urtica dioica extract 300mg.	*β*-sitosterols	For the relief of the symptoms occurring in the early stages of prostatic hyperplasia.	PHARMATON
Pyralvex®	Solution	1ml contains 0.05g extract Rhei corresponding to 0.003g anthraquinon glycosides.	Anthraquinon glycosides	To treat the acute and chronic inflammation of the mucous membranes of the mouth and gums. Aphthous stomatitis, alveolar pyorrhea and teething trouble.	NORGINE United Kingdom.
Rowachol ®	Soft Gelatin Capsules	Each gelatine capsule contains: α- Pinene 13.6mg β- Pinene 3.4mg Menthol 32mg Menthon 6mg Camphene 5mg Borneol 5mg Cineol 2mg Olive oil 33mg	Essential oils.	For the treatment of hepato-biliary disorders including the dissolution of gallstones.	ROWAWAGNFR Germany.
Rowatinex®	Soft Gelatin Capsules	Each soft capsule contains: α -Pinene 24.8mg β -Pinene 6.2mg Camphene 15mg Borneol 10mg Anethol 4mg Fenchone 4 mg Cineol 3mg Olive oil 33 mg.	Essential oils.	It is indicated for treatment of: - Renal and urinary disorders. - Painful spasms and inflammation of the urinary tract associated with urolithiasis. - For the dissolution and expulsion of urinary tract stones.	ROWAWAGNFR Germany.
Senna Lax ®	Tablets	Each tablet contains: Calcium salts of purified senna extract 20mg (equivalent to 12mg: senna-glycosides).	Anthraquinone glycosides Such as sennoside A and sennoside B	Used for treatment of chronic habitual constipation.	The NILE CO. For pharmaceuticals. And chemical industries. Egypt.
Senokot	Tablets	Each tablet contains calcium salts of purifed senna extratct (equivalnt to 12mg of sennosides).	Anthraquinons, sennoside A and B.	Atonic constipation.	Rickitt Benckiser Healthcare. U.K.
Siberian-Ginseng®	Caplet	Each caplet contains: Pure siberian Ginseng root 650mg.	Saponines (ginsinosides)	To improve physical and psychogenic status	Jamiesson Laboratories Canada.
SOOTHEX®	Syrup	Each 5ML of SOOTHEX syrup contains: Eucalyptus globules ext. 0.5ml Ginger extract 0.2ml	Essential oils	Used as a cough syrup for throat soreness; as an antiseptic diaphoretic; wetting agent and mild expectorant.	DELASS Jordan.

Table 1: Continue,

Songanight®	Tablet	Eeach coated tablet contains Dry extract of Valerian root 120.0mg Dry extract of Melissa leaves 80.0mg.	Essential oils.	For difficulty in getting to sleep, when of nervous origin.	PHARMATON SWITZERLAND .
SS-Cream®	Cream	Each lg contains: - 70% ethanol extract of Bufonis venenum (2:1) 10mg - extract of Angelicae gigantis radix, Cistanchis herba, Torilis semen, Ginseng radix alba, Zanthoxyli fructose 100.0mg. - Extract of Asiasari radix, Caryophyli flos, and Cinnamomi cortex 10.0mg.	Essential oils, coumarins, saponins,	To control premature ejaculation.	HIKMA JORDAN.
Tomex®	Dragees	Each dragee contains 200mg of specilly prepared garlic powder	Essential oils, saponins.	To improve blood circulation and tissue perfusion. It has antiviral, antifungal and bactericidal effect.	ATOS pharma EGYPT.
URINEX®	Soft Gelatin Capsules	Each gelatine capsule contains: Pinene(α+β) 31mg Camphene 15mg Borneol 10mg Fenchone 4mg Anethole 4mg Cineole 3mg	Essential oils	Indicated for treatment of: - Renal and urinary disorders. - Painful spasms and inflammation of the urinary tract associated with urolithiasis. - For the dissolution and expulsion of urinary tract stones.	Pharco Pharmaceuticals EGYPT.
Venoruton®	Tablet and GEL	Venoruton contains O-(β-hydroxyethyl) - rutoside.	Flavonoids	Helps to restore normal function to the smallest blood vessels. It is used for treatment of venous disorders and haemorrhoids.	NOVARTIS Switzerland.
White farm capsuls®	Capsules	Each capsule contains: 250mg. Natural panax ginseng extract.	saponins	Animia, Diabeties, impotance, ;loss of apitite, General weakness.	White farm, S.L Spain.

Table 2: Percentage of the main biological active compounds (MBACs) in registered and standardized herbal medicines (RSHM) in the Jordanian pharmaceutical market(JPM) in the first half of 2008.

main biological active compounds (MBACs)	%
Anthraquinons	17.39
Coumarins	2.17
Essential oils	36,95
Flavonoids	17.39
Fruit acids	4.34
Mixture of enzymes, fatty acids, amino acids, sugars, and proteins	8.69
Polysaccharides	8.69
ß-sitosterols	8.69
Saponines	28.26

Each percentage is calculated as the number of the herbal drugs containing the MBACs divided by a total of 46 herbal drugs tested x 100.

The results of this study showed that there was a variation of the main biological active compounds (MBACs) in RSHM produced by JPC. Their percentage values to their corresponding MBACs in 2008 are shown in Table 2. About 36.95% of these medicines contain essential oils as MBACs. Coumarines and fruit acids are the main active biological compounds of little amount of RSHM present in JPM and represent 2.17 % and 4.34%, respectively. On the other hand, saponines represent 28.26 %, each flavonoides and anthraquinones represent 17.39%, a mixture of (enzymes - fatty acids - amino acids – vitamins-minerals-proteins), polysaccharides and ß-sitosterols, represent 8.69 % of these drugs (Table 2). In comparison with the results obtained in 2007. According to the MBACs of RSHM produced by JPC in 2007, arising in the production level of these medicines was observed in 2008.

They were 25 % saponines, 15,90% flavonoides, 13,63 %, anthraquinones, 9,09 % mixture of (enzymes - fatty acids - amino acids – proteins), 4,54 % polysaccharides and 4,54 % ß-sitosterols.

Conclusion:

The results of this study showed that RSHM counts only for a small percentage of all the medicines present in JPM compared to synthetic ones. However, herbal drug industry in Jordan is growing fast recently compared to that in the last few years.

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