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Re: Herbal Medicines Pose Dangers to Public

.....Health Experts Cautions



My attention was recently drawn to an article published in the Ghanaian Times (Saturday, 21st May 2022), which was attributed to one Dr. Adam Atiku, the Director of Medicine at the Tamale Teaching Hospital, warning the general public to desist from patronizing herbal medicines as they pose danger to the general public. Be it as it may, I found the headline by the Ghanaian Times misleading, as the substance of the story, did not match the headline it was given.

Dr. Atiku asserted that some herbal medicines were not verified scientifically, and pose danger to the health of the people. This assertion, I understand. And as an objective scientist and researcher in Naturopathy, it is trite that some herbals are not verified scientifically. I think Ghanaian Times could have done the public good with a more appropriate headline. In an era of evidence-based medicine, we need to do away with the practice of “emotional medicine”. I believe we need more Medical Journalists in Ghana to report on medical issues as the mainstream Journalists who have no medical background are reporting on scientific issues wrongly.

We cannot survive as a species without herbs. Without plants, we would lose the human race as they aid our survival. Plants protect us and preserve our mere existence. Pharmaceutical industries largely depend on plants for the development of mainstream drugs. A full 40 percent of the drugs behind the pharmacist's counter in the Western world are derived from plants that people have used for centuries, including the top 20 best-selling prescription drugs in the United States today.

Vickers et al., (2001) note that many conventional drugs originate from plant sources. About a century ago, most of the few effective drugs were plant-based. Examples include aspirin (from willow bark), digoxin (from foxglove), quinine (from cinchona bark), and morphine (from the opium poppy). Find below a summary of drugs derived from plant sources (Taylor, Leslie. *Plant-Based Drugs and Medicines*. Square One Publishers, 2000, Garden City Park, N.Y)

Drugs Derived from Plants		
Drug/Chemical	Action	Plant Source
Acetyldigoxin	Cardiotonic	Digitalis lanata (Grecian foxglove, woolly foxglove)
Adoniside	Cardiotonic	Adonis vernalis (pheasant's eye, red chamomile)
Aescin	Anti-inflammatory	Aesculus hippocastanum (horse chestnut)
Aesculetin	Antidysentery	Fraxinus rhychophylla
Agrimophol	Anthelmintic	Agrimonia supatoria
Ajmalicine	Treatment for circulatory disorders	Rauvolfia sepentina
Allantoin	Vulnerary	Several plants
Allyl isothiocyanate	Rubefacient	Brassica nigra (black mustard)

Drugs Derived from Plants

Anabesine	Skeletal muscle relaxant	Anabasis sphylla
Andrographolide	Treatment for bacillary dysentery	Andrographis paniculata
Anisodamine	Anticholinergic	Anisodus tanguticus
Anisodine	Anticholinergic	Anisodus tanguticus
Arecoline	Anthelmintic	Areca catechu (betel nut palm)
Asiaticoside	Vulnerary	Centella asiatica (gotu cola)
Atropine	Anticholinergic	Atropa belladonna (deadly nightshade)
Benzyl benzoate	Scabicide	Several plants
Berberine	Treatment for bacillary dysentery	Berberis vulgaris (common barberry)
Bergenin	Antitussive	Ardisia japonica (marlberry)
Betulinic acid	Anticancerous	Betula alba (common birch)
Borneol	Antipyretic, analgesic, antiinflammatory	Several plants
Bromelain	Antiinflammatory, proteolytic	Ananas comosus (pineapple)
<u>Caffeine</u>	CNS stimulant	Camellia sinensis (tea, also coffee, cocoa, and other plants)
Camphor	Rubefacient	Cinnamomum camphora (camphor tree)
Camptothecin	Anticancerous	Camptotheca acuminata

Drugs Derived from Plants

(+)-Catechin	Hemostatic	Potentilla fragarioides
Chymopapain	Proteolytic, mucolytic	Carica papaya (papaya)
Cissampeline	Skeletal muscle relaxant	Cissampelos pareira (velvet leaf)
<u>Cocaine</u>	Local anesthetic	Erythroxylum coca (coca plant)
Codeine	Analgesic, antitussive	Papaver somniferum (poppy)
Colchicine amide	Antitumor agent	Colchicum autumnale (autumn crocus)
Colchicine	Antitumor, antigout	Colchicum autumnale (autumn crocus)
Convallatoxin	Cardiotonic	Convallaria majalis (lily-of-the-valley)
Curcumin	Choleretic	Curcuma longa (turmeric)
Cynarin	Choleretic	Cynara scolymus (artichoke)
Danthron	Laxative	Cassia species
Demecolcine	Antitumor agent	Colchicum autumnale (autumn crocus)
Deserpidine	Antihypertensive, tranquilizer	Rauvolfia canescens
Deslanoside	Cardiotonic	Digitalis lanata (Grecian foxglove, woolly foxglove)
L-Dopa	Anti-parkinsonism	Mucuna species (nescafe, cowage, velvetbean)
Digitalin	Cardiotonic	Digitalis purpurea (purple foxglove)
Digitoxin	Cardiotonic	Digitalis purpurea (purple foxglove)

Drugs Derived from Plants

Digoxin	Cardiotonic	Digitalis purpurea (purple or common foxglove)
Emetine	Amoebicide, emetic	Cephaelis ipecacuanha
Ephedrine	Sympathomimetic, antihistamine	Ephedra sinica (ephedra, ma huang)
Etoposide	Antitumor agent	Podophyllum peltatum (mayapple)
Galanthamine	Cholinesterase inhibitor	Lycoris squamigera (magic lily, resurrection lily, naked lady)
Gitalin	Cardiotonic	Digitalis purpurea (purple or common foxglove)
Glaucarubin	Amoebicide	Simarouba glauca (paradise tree)
Glaucine	Antitussive	Glaucium flavum (yellow horn poppy, horned poppy, sea poppy)
Glasiovine	Antidepressant	Ocotea glaziovii
Glycyrrhizin	Sweetener, treatment for Addison's disease	Glycyrrhiza glabra (licorice)
Gossypol	Male contraceptive	Gossypium species (cotton)
Hemsleyadin	Treatment for bacillary dysentery	Hemsleya amabilis
Hesperidin	Treatment for capillary fragility	Citrus species (e.g., oranges)
Hydrastine	Hemostatic, astringent	Hydrastis canadensis (goldenseal)

Drugs Derived from Plants

Hyoscyamine	Anticholinergic	<i>Hyoscyamus niger</i> (black henbane, stinking nightshade, henpin)
Irinotecan	Anticancer, antitumor agent	<i>Camptotheca acuminata</i>
Kaibic acid	Ascaricide	<i>Digenea simplex</i> (wireweed)
Kawain	Tranquilizer	<i>Piper methysticum</i> (kava kava)
Kheltin	Bronchodilator	<i>Ammi visage</i>
Lanatosides A, B, C	Cardiotonic	<i>Digitalis lanata</i> (Grecian foxglove, woolly foxglove)
Lapachol	Anticancer, antitumor	<i>Tabebuia</i> species (trumpet tree)
a-Lobeline	Smoking deterrent, respiratory stimulant	<i>Lobelia inflata</i> (Indian tobacco)
Menthol	Rubefacient	<i>Mentha</i> species (mint)
Methyl salicylate	Rubefacient	<i>Gaultheria procumbens</i> (wintergreen)
Monocrotaline	Topical antitumor agent	<i>Crotalaria sessiliflora</i>
Morphine	Analgesic	<i>Papaver somniferum</i> (poppy)
Neoandrographolide	Treatment of dysentery	<i>Andrographis paniculata</i>
Nicotine	Insecticide	<i>Nicotiana tabacum</i> (tobacco)
Nordihydroguaiaretic acid	Antioxidant	<i>Larrea divaricata</i> (creosote bush)
Noscapine	Antitussive	<i>Papaver somniferum</i> (poppy)

Drugs Derived from Plants

Ouabain	Cardiotonic	Strophanthus gratus (ouabain tree)
Pachycarpine	Oxytocic	Sophora pschycarpa
Palmatine	Antipyretic, detoxicant	Coptis japonica (Chinese golden thread, goldthread, Huang-Lia)
Papain	Proteolytic, mucolytic	Carica papaya (papaya)
Papaverine	Smooth muscle relaxant	Papaver somniferum (opium poppy, common poppy)
Phyllodulcin	Sweetener	Hydrangea macrophylla (bigleaf hydrangea, French hydrangea)
Physostigmine	Cholinesterase inhibitor	Physostigma venenosum (Calabar bean)
Picrotoxin	Analeptic	Anamirta cocculus (fish berry)
Pilocarpine	Parasympathomimetic	Pilocarpus jaborandi (jaborandi, Indian hemp)
Pinitol	Expectorant	Several plants (e.g., bougainvillea)
Podophyllotoxin	Antitumor, anticancer agent	Podophyllum peltatum (mayapple)
Protoveratrines A, B	Antihypertensives	Veratrum album (white false hellebore)
Pseudoephedrine	Sympathomimetic	Ephedra sinica (ephedra, ma huang)
nor-pseudoephedrine	Sympathomimetic	Ephedra sinica (ephedra, ma huang)
Quinidine	Antiarrhythmic	Cinchona ledgeriana (quinine tree)

Drugs Derived from Plants

Quinine	Antimalarial, antipyretic	Cinchona ledgeriana (quinine tree)
Quisqualic acid	Anthelmintic	Quisqualis indica (Rangoon creeper, drunken sailor)
Rescinnamine	Antihypertensive, tranquilizer	Rauvolfia serpentine
Reserpine	Antihypertensive, tranquilizer	Rauvolfia serpentine
Rhomitoxin	Antihypertensive, tranquilizer	Rhododendron molle (rhododendron)
Rorifone	Antitussive	Rorippa indica
Rotenone	Piscicide, Insecticide	Lonchocarpus nicou
Rotundine	Analgesic, sedative, tranquilizer	Stephania sinica
Rutin	Treatment for capillary fragility	Citrus species (e.g., orange, grapefruit)
Salicin	Analgesic	Salix alba (white willow)
Sanguinarine	Dental plaque inhibitor	Sanguinaria canadensis (bloodroot)
Santonin	Ascaricide	Artemisia maritima (wormwood)
Scillaridin A	Cardiotonic	Urginea maritima (squill)
Scopolamine	Sedative	Datura species (e.g., Jimsonweed)
Sennosides A, B	Laxative	Cassia species (cinnamon)
Silymarin	Antihepatotoxic	Silybum marianum (milk thistle)
Sparteine	Oxytocic	Cytisus scoparius (scotch broom)
Stevioside	Sweetener	Stevia rebaudiana (stevia)

Drugs Derived from Plants

Strychnine	CNS stimulant	Strychnos nux-vomica (poison nut tree)
Taxol	Antitumor agent	Taxus brevifolia (Pacific yew)
Teniposide	Antitumor agent	Podophyllum peltatum (mayapple or mandrake)
Tetrahydrocannabinol (<u>THC</u>)	Antiemetic, decreases ocular tension	Cannabis sativa (marijuana)
Tetrahydropalmatine	Analgesic, sedative, tranquilizer	Corydalis ambigua
Tetrandrine	Antihypertensive	Stephania tetrandra
<u>Theobromine</u>	Diuretic, vasodilator	Theobroma cacao (cocoa)
Theophylline	Diuretic, bronchodilator	Theobroma cacao and others (cocoa, tea)
Thymol	Topical antifungal	Thymus vulgaris (thyme)
Topotecan	Antitumor, anticancer agent	Camptotheca acuminata
Trichosanthin	Abortifacient	Trichosanthes kirilowii (snake gourd)
Tubocurarine	Skeletal muscle relaxant	Chondodendron tomentosum (curare vine)
Valpotriates	Sedative	Valeriana officinalis (valerian)
Vasicine	Cerebral stimulant	Vinca minor (periwinkle)

Drugs Derived from Plants		
Vinblastine	Antitumor, Antileukemic agent	Catharanthus roseus (Madagascar periwinkle)
Vincristine	Antitumor, Antileukemic agent	Catharanthus roseus (Madagascar periwinkle)
Yohimbine	Aphrodisiac	Pausinystalia yohimbe (Yohimbe)
Yuanhuacine	Abortifacient	Daphne genkwa (lilac)
Yuanhuadine	Abortifacient	Daphne genkwa (lilac)

The development of drugs from plants continues, with pharmaceutical companies engaging in large-scale pharmacological screening of herbs. Today, we hail India, China, and many other countries for their large investments and immense development in their Traditional Medicine sector, yet we as a nation are trying to destroy ours. Are we waiting for people from other countries to come and tell us the potentials we have before we develop our herbal and natural medicine sector? I can tell you on authority, that many medical professionals opt for herbal products in this country. The likes of Duffy Ohemaa Products making waves in this country and many others are doing extremely well in the herbal sector. All they need is just government support to compete globally.

Today, India is promoting Ayush visas for tourists who want to visit their country to seek Traditional Medicines. As a way to improve Ayush products, India will soon introduce the AYUSH mark, which will give authenticity to quality AYUSH products in the country. The mark will be given to products vetted using the latest technology. This will give confidence to people around the world that they are purchasing quality AYUSH products.

According to aihms.in (2021), India has over 3000 hospitals and 500 colleges committed to the spread of AYUSH practices, India has arisen as a world leader in this branch

of medicine. Numerous wellness parks have also been established around the country that emphasize the significance of AYUSH practices.

AYUSH includes Ayurveda, yoga and naturopathy, Unani, Siddha, and homeopathy. The objective of AYUSH is to promote medical pluralism and to introduce strategies for mainstreaming the indigenous systems of medicine. In India, at the Union Government level, AYUSH activities are coordinated by the Department of AYUSH, under the Ministry of Health and Family Welfare.

These medicines are cost-effective as compared to other synthetic products. At present, India is also one of the top exporters of alternative medicines in the world. Major export destinations include the United States and European countries like Germany and France. The government of India is continuously supporting the industry with investments in scientific research in AYUSH, building the necessary infrastructure and regulatory framework to regulate this system of medicine.

A report by Mordor Intelligence (2022) found that AYUSH and the alternative medicine industry in India are expected to register a CAGR of 8.6% during the forecast period. In the context of COVID-19, the market for alternative medicines, like Ayurveda, has increased due to the increasing demand for various ayurvedic products to boost immunity. According to a report published in August 2020, beginning March 2020, the demand for honey went up 45%, chyawanprash by 85%, and turmeric by 40% in ayurvedic stores. The interest in these products was mostly fueled by the recommendations from the Ministry of AYUSH to fight COVID-19.

The Hindu (2022) also reported that the global market for herbal medicine was valued at \$657.5 billion in 2020. It is expected to grow to \$746.9 billion by the end of 2022. In China, the traditional medicine industry had total revenue of \$37.41 billion in 2018, according to an IBISWorld report.

The Indian Business Today (2021) also reported that the market size of the AYUSH sector grew by 17 percent between 2014 and 2020 to reach \$18.1 billion, according to the Union Ayush Minister Sarbananda Sonowal. Despite a slump in economic activity in 2020 due to the COVID-19 pandemic, the industry was projected to reach \$20.6 billion in 2021 and \$23.3 billion in 2022. In terms of the global share, India has grown faster in the AYUSH market as

compared to the world and accounts for about 2.8 percent of the market, which it is likely to hold. Different product segments have grown at a much higher rate than the overall industry during the same time frame i.e., 2014 to 2020. Plant derivatives experienced 21 percent growth in the period 2014-2020 followed by nutraceuticals (20.5 percent), pharmaceuticals (15.8 percent), plant extracts 14.7 percent, and herbal plants (14.3 percent).

PharmaBiz.com (2022) also reported that the Indian Medicines Pharmaceutical Corporation Limited (IMPCL), the public sector manufacturing unit of the Ministry of Ayush recorded a turnover of Rs. 164.33 crore (tentative figure) for the financial year 2020 to 2021. This is the highest number achieved in the company's history and an all-time high profit of approximately Rs 12 crore is reported for the year. In the previous year, 2019 to 2020, the best revenue figure of the company was Rs. 97 crores. This growth is reflective of the fast-growing adoption of Ayush products and services by the public in the wake of the Covid-19 pandemic.

In the case of China, in 1982, the Constitution of China gave full recognition to TCM. Since 2009, there has been continuous support for TCM in health policies. China has focused on developing quality infrastructure for TCM to co-exist with modern medicine under the same roof.

In November 2020, the AYUSH Ministry approved the manufacture of Astha-15, an Ayurvedic COVID-19 drug by Dalmia Healthcare. In May 2020, The AYUSH Ministry, in collaboration with the Health Ministry, launched the clinical trials of Ashwagandha, Yashtimadhu, Guduchi Pippali, and a polyherbal formulation (Ayush-64) Ayurvedic medicines for novel COVID-19 infection.

Regardless of why an individual uses it, traditional medicine provides an important health care service, whether people have physical or financial access to allopathic medicine, and it is a flourishing global commercial enterprise (Engelbreton 2002; Conboy et al., 2007; Evans et al., 2007). In 1990, expenditure associated with "alternative" therapies in the United States was estimated to be US\$13.7 billion. This had doubled by the year 1997, with herbal medicines growing faster than any other alternative therapy (Eisenberg et al. 1998). In Australia, Canada, and the United Kingdom, annual expenditure on traditional medicine is

estimated to be US\$80 million, US\$1 billion, and US\$2.3 billion, respectively. These figures reflect the incorporation of herbal and other forms of traditional medicine into many health care systems and its inclusion in the medical training of doctors in many parts of the developed world.

The total commercial value of the ethnobotanicals market cannot be ignored. In 1995, the total turnover of nonprescription-bound herbal medicines in pharmacies was equal to almost 30% of the total turnover of nonprescription-bound medicines in Germany, and in the United States, the annual retail sales of herbal products were estimated to be US\$5.1 billion. In India, the use of herbal medicine is a common practice, and about 960 plant species are used by the Indian herbal industry, of which 178 are of a high volume, exceeding 100 metric tons per year (Sahoo, 2010). In China, the total value of herbal medicine manufactured in 1995 reached 17.6 billion Chinese yuan (approximately US\$2.5 billion; Eisenberg et al., 1998; WHO, 2001). This trend has continued, and annual revenues in Western Europe reached US\$5 billion in 2003-2004 (De Smet, 2005). In China, sales of herbal products totaled US\$14 billion in 2005, and revenue from herbal medicines in Brazil was US\$160 million in 2007 (World Health Organization; http://www.who.int/topics/traditional_medicine/en/). It is estimated that the annual worldwide market for these products approached US\$60 billion (Tilburt and Kaptchuk 2008).

We cannot demean our Traditional Medicines and hide in our bedrooms and use them privately. I believe, Natural Medicines in Ghana could be another ‘e-levy’ to generate funds for the government if we pay attention to developing the herbal industry.

Nobody is immune from herbs. We use them daily and they are in our kitchens. It is time we do away with academic arrogance in the medical sector as well and let us raise little “David” high enough to challenge “Goliath” as India and others have done. Let us do away with the “old wine” mentality and embrace new wine ideals in the health sector.

In conclusion, Paul said, “One man's faith allows him to eat everything, but another man, whose faith is weak, eats only vegetables or herbs” (Romans 14:2 NIV). This is a myopic scruple that Paul was dealing with.

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