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ETHNO MEDICINAL PLANTS WITH POTENTIAL ANTIPSORIATIC ACTIVITY-A REVIEW

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ABSTRACT

Psoriasis is an auto immune mediated inflammatory disease. With multifactorial etiology which is characterized by plaques and patches on skin. Many synthetic drugs are available in the market for treating psoriasis but they are associated with various adverse/side effects. So, Researchers worldwide are searching for the new, safer and effective drugs which obtained from natural resources. The main objective of this paper is to list out the traditional plants used in treatment of psoriasis. Plants selected for the present review are having medicinally significant value and many of them possess active phytochemical constituents which helps in treating the disease.

KEYWORDS

Psoriasis, Inflammatory disease, Non-contagious, Synthetic drugs, Adverse effects and Phytochemical constituents.

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INTRODUCTION

An autoimmune chronic disease with a substantial genetic and environmental component is psoriasis. The word "disease" comes from the Greek words "Psora" and "Isis," which both signify itching and inflammation. Psoriasis is a dry, inflammatory skin condition that is not communicable. The scalp, fingers, toes, palms, elbows, under the breasts and genitals, knees, and elbows are the most usually affected areas¹. It is primarily characterised by sharply scaly, erythematous plaques. 1-3% of the world's population are impacted². Due to psoriasis' autoimmune nature, no diagnostic tests are currently available³. The side effects that are frequently connected to different therapy have prevented the existing treatments from completely

meeting the needs of the patients. Additionally, with prolonged drug exposure, a significant percentage of patients would acquire treatment resistance⁴. Natural remedies seem promising in the management of wide range of dermatological conditions including psoriasis vulgaris⁵.

LITERATURE REVIEW

Medicinal plants for management of psoriasis

Herbal medicines are important useful role and less side effects. The natural plants are best source used in medicinal products. Herbal medicines easily available and use to diagnose disease. Natural remedies used for psoriasis treatment. The brief note on natural plants used mainly treatment of psoriasis^{6,7}.

Silybummarianum

Silybummarianum (L.) Gaertn, common name milk thistle, of the family Asteraceae is an herbaceous annual species of considerable medicinal importance⁸. This plant is very well known for its hepatoprotective activity. Since the numerous changes have been detected in the liver of patients with psoriasis, including steatosis, periportal inflammation, fibrosis, necrosis and cirrhosis, Silybummarianum can be effective for skin disorders such as psoriasis⁶. They contain silibinin (silybin), silychristin and silidianin. Silibinin is most biological active constituent. The seeds contain flavonolignans, betaine, apigenin, proteins, silybonol, free fatty acids and fixed oil. They used to treat liver diseases, gallbladder, anti-oxidant and hepatoprotective activity and psoriasis^{9,7}.

Burdock

Medicinal species of Burdock are *Arctium lappa*, *Arctium minus*, *Lappa major* or *Bardanae radix*. Burdock is in the family of *Compositae/Asteraceae*. Active ingredients in *Arctium lappa* include:

Sulphur about of 00.1–0.002%.

Polysaccharides and mucilages such as xyloglucan.

Lignans such as arctigenin.

Other components such as organic acids that includes acetic, butyric, caffeic, chlorogenic, isovaleric, linoleic, linolenic, myristic, oleic, palmitic, propionic, stearic, tiglic, aldehydes,

carbohydrates, sesquiterpene lactones and phytosterols. This plant acts as anti-inflammatory agent.

Burdock is used in variety of dermatologic conditions (eczema, psoriasis)¹⁰.

Aloe Vera

The biological source of aloe is dried latex of leaves. It belongs to the *Liliaceae* family¹¹. The active agents shows considerable, anti-inflammatory and wound healing properties and thus justifying consideration of Aloe Vera as an effective remedy for the treatment of psoriasis¹². The aloe group showed significantly higher rates of clearing the psoriatic plaques in almost all patients. Anthraquinone and acemannan are the main active compounds in Aloe Vera, have antibacterial activity against *Staphylococcus* and *Streptococcus* species and may provide a rationale for their therapeutic efficacy in psoriasis.

Pongamiapinnata

Pongamiapinnata belong to *Leguminosae* family, this tree is popularly known as *Karanja* in Hindi, *Indian Beech* and *Derris indica* in English respectively¹³. Its seeds are used in febrile and inflammatory diseases in Indian system of medicine. Previous preliminary studies with ethanolic seed extract of this plant had exhibited an anti-inflammatory effect¹⁴. They contain 28% to 34% oil on average, with a high percentage of polyunsaturated fatty acids helps in treating psoriasis¹⁵.

Psoraleacorylifolia

Psoraleacorylifolia Linn (*Fabaceae*) is an erect annual herb with broadly elliptic leaves, yellowish or bluish-purple flowers and compressed, mucronate, dark chocolate to almost black coloured seeds¹⁶. Phytochemical studies indicated that coumarins, flavonoids, and meroterpenes are the main components of *Psoraleacorylifolia*, and most of these components are present in the seeds or fruits¹⁷. *Psoraleacorylifolia* is a renowned medicinal plant in the arena of traditional herbal medicine. It has been extensively used in the treatment of various skin disorders, including psoriasis¹⁸.

Calendulaofficinalis

Calendulaofficinalis leaves were selected based on the traditional knowledge. *C. officinalis* (CO) (Family: Asteraceae), commonly known as the pot marigold, is abundantly available throughout India and is cultivated in most soils in a sunny climate. The leaves contain carotenoids such as lutein, zeaxanthin, and beta carotene^{19,20}. Apart from that, the leaves also include polyphenols, alkaloids, steroids, tannins, and flavonoids. Many applications are reported with the flowers, whereas traditionally the leaves are used for wound healing and inflammatory conditions (Psoriasis), mainly due to the presence of essential phytoconstituents in the leaves²¹.

Liquorice

Liquorice is dried unpeeled rhizome or root *Glycyrrhizaglabra*. Liquorice is belonging to the family Fabaceae. Liquorice contain water-soluble, active constituent of Glycyrrhizic acid, flavonoids, liquiritigenin and isoliquiritigenin. They cultivated in Spain, Italy and France. They are used as anti-pain properties, demulcent, corticosteroid and anti-inflammatory activity. The herbal extract used to treat psoriasis²².

Matricariarecutita

It is also known as Chamomile. The chamomile flowers have a long therapeutic tradition in treating gastrointestinal ailments. The rationale for its use in psoriasis is that chamazulene, a by-product of the non-volatile oil extract, matricin, known to have anti-inflammatory activity by inhibition of lipoxigenase and as a result, leukotriene B4 (LTB4) formation. Chamomile oil has antimicrobial activity against skin pathogens *Staphylococcus* and *Candida*. The flavonoids, quercetin and apigenin, are also active compounds of the flower. Quercetin is reported to be a potent inhibitor of lipoxigenase and to a lesser degree, cyclooxygenase. Quercetin also shows good skin penetration property²³.

Momordicacharantia

Momordicacharantia locally known as Bitter Gourd. It is an herbaceous, tendril-bearing vine, growing up to 5m. It is used in the form of decoctions and infusions to treat bacterial infections and also

claimed to be an effective against variety of skin conditions like psoriasis, acne, wounds²⁴. It is very common Indian herb having various medicinal properties for the treatment of different kind of disease; viz. wound healing, antifungal and anti diabetic agents respectively²⁵. These herbs have been reported for their usefulness in the form of decoctions, infusions and tinctures in traditional system of medicines for treating skin diseases like psoriasis, leprosyetc^{24,26}.

Curcumalonga

Curcuma longa commonly known as Turmeric; it is a rhizomatous herb. The rhizome is the portion of the plant used medicinally. It is also reported decreased PhK activity in the curcumin and calcipotriol treated groups corresponded to severity of parakeratosis, decreases in keratinocyte transferring receptor expression and density of epidermal CD8+T cells²⁷.

Nigellasativa

Nigella sativa Linn. is an annual herb of the Ranunculaceae family. It is popularly known as black cumin. The *Nigella sativa* seeds contain ingredients, including nutritional components such as carbohydrates, fats, vitamins, mineral elements, and proteins, including eight of the nine essential amino acids²⁸⁻³¹. Pharmacological investigations of the seed extract reveal a wide spectrum of activities including anti-inflammatory, antibacterial, antifungal and antihelmenthic³². The seeds are externally applied for eruptions of skin. The seeds are used traditionally for psoriasis tropicus with general pain and eruption of patches³³.

Wrightiatinctoria

Reported the hydroalcoholic extract of *Wrightiatinctoria* leaves showed significant antipsoriatic effect on mouse tail test model, as compared to isotretinoic acid as standard. They found the extract to produce significant orthokeratosis, prominent antioxidant activity in DPPH, Nitric oxide and hydrogen peroxide scavenging assay^{34,35}.

Rubiaccordifolia

Rubiaccordifolia is a perennial climbing herb. *Rubiaccordifolia*, often known as common

madder or Indian madder, is a species of flowering plant in the coffee family, Rubiaceae. It has been cultivated for a red pigment derived from roots. phytochemicals such as combined anthraquinones, free anthraquinones, alkaloids, steroids, flavones, flavonoids, phenols, saponins, tannins, proteins and glycosides were found in solvent root extract³⁶. These extracts of plant are used for treating different skin infections; it may be a useful plant in the treatment and management of psoriasis³⁷.

Azadirachtaindica

Neem, (*Azadirachtaindica*), also called nim or margosa, fast-growing tree of the mahogany family (Meliaceae), valued as a medicinal plant³⁸. *Azadirachtaindica* L. (neem) shows therapeutics role in health management due to rich source of various types of ingredients. The most important active constituent is azadirachtin³⁹. Quercetin and β -sitosterol, polyphenolic flavonoids, were purified from neem fresh leaves and were known to have anti-inflammatory properties⁴⁰ and seeds hold valuable constituents including gedunin and azadirachtin. The seed oil is used externally to treat Psoriasis⁴¹.

Thespesiapopulnea

Botanical name of Indian tulip tree *Puvarasuis* is *thespesiapopulnea*. It belongs to Malvaceae family, phytochemical studies indicated that methanolic extract of *Thespesiapopulnea* flowers contains flavonoids, alkaloids, tannins and anthroquinone glycosides⁴². Traditionally claimed to be useful in the treatment of cutaneous affections such as psoriasis Oil prepared by boiling the ground bark in coconut oil is applied externally in psoriasis⁴³.

Melissaofficinalis

Melissaofficinalis L. (lemon balm) is widely used in Greece. Triterpene derivatives and polyphenolic compounds are present in aqueous decoction and organic extract of the plant. The decoction and the dichloromethane extract revealed significant antipsoriatic and antioxidant activity. The dichloromethane extract was a weaker antioxidant. The decoction decreases skin dryness and enhanced skin barrier function⁴⁴.

Dodonaepolyandra

A traditional medicinal plant from Cape York Peninsula Australia, leaf extract has also been used in nanoparticle synthesis. These particles have shown a significant role in treating psoriasis⁴⁵. Contains polyandric acid A, the diterpenoid. Topical application of the phytochemical to the mouse ear showed inhibition of interleukin-1 β production. It reduced the ear thickness and myeloperoxidase accumulation in chronic skin inflammation model. Pre-treatment of neonatal human keratinocytes with polyandric acid a reduced production of IL-6⁴⁶.

Stellerachamaejasme

Ethanollic extract of aerial parts of *Stellerachamaejasme* (Langdu) and its phytoconstituent, luteolin 7-O-glucoside, improved atopic dermatitis like reaction in mice. The extract significantly reduced inflammatory cell infiltration. Serum IL-4 and IgE levels were lowered by Luteolin 7-O-glucoside. It increased skin hydration by reducing water loss through epidermis⁴⁷.

Viola Tricolor

Viola tricolor L. (heartsease) was extracted with water, and the bioactive components were determined using bioactivity-guided fractionation and their effect on lymphocyte functions were evaluated. The aqueous extract, containing circular plant peptides cyclotides, inhibited the proliferation of activated lymphocytes. The bioactivity was attributed to down regulation of secretion of interleukin-2, production of interferon- γ and tumor necrosis factor- α . IL-2 receptor expression was unaffected⁴⁸.

Psoriasis is induced due to the absence of two late cornified envelope (LCE3) genes from a group of five (LCE) genes. Both 1, 25-dihydroxyvitamin D3 and cyaniding upregulated expression of all five LCE3 genes in primary human keratinocytes, cyanidin, being more potent than vitamin D3. Proanthocyanidins, cyaniding, natural compounds are useful in psoriasis⁴⁹.

Tribulusterrestris

It has a long history of uses throughout the world. *Tribulusterrestris* (family Zygophyllaceae),

commonly known as Gokshur or Gokharu or puncture vine, has been used for a long time in both the Indian and Chinese systems of medicine for treatment of various kinds of diseases⁵⁰. It has been used in China for more than four decades years to treat conditions such as premature ejaculation, psoriasis, liver disease and eczema⁵¹. Other ancient Eastern cultures used Tribulusteristris for its diuretic properties and to treat infections. The preliminary phytochemical constituents such as saponins, flavonoids, glycosides, alkaloids, and tannins⁵². Reported that furostanol and spirostanolsaponins of tigogenin, neotigogenin, gitogenin, neogitogenin, hecogenin, neohecogenin, diosgenin, chlorogenin, ruscogenin, and sarsasapogenin types are frequently found in this plant. Helps in treating psoriasis⁵³.

CONCLUSION

Psoriasis includes serious skin conditions that have an impact on the patient's quality of life. The most effective and affordable psoriasis medications are still widely unavailable. To treat this illness, there are several synthetic medications on the market, however they have undesirable side effects. Consequently, an effort was made to include the chemical components that had been extracted from various plants and were responsible for their anti-psoriatic effect. In the current review study, 20 different medicinal plants-including aloe vera, liquorice, curcuma longa, wrightiatinctoria, and many others-have their traditional anti-psoriatic effects validated scientifically.

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CONFLICT OF INTEREST

We declare that we have no conflict of Interest.

BIBLIOGRAPHY

1. Kuchekar A B, Pujari R R. Psoriasis: A comprehensive review, *Int. J. of Pharm and Life Sci*, 2(6), 2011, 857-877.
2. <http://www.sign.ac.uk/pdf/pat121.pdf>.
3. Ortonne J P. Aetiology and pathogenesis of psoriasis, *Br J Dermatol*, 135(49), 1996, 1-5.
4. Lebwohl M, Ali S. Treatment of psoriasis Part 1 Topical therapy and phototherapy, *J Am Acad Dermatol*, 45(4), 2001, 487-498.
5. Brown D J, Dattner A M. Phytotherapeutic approaches to common dermatologic conditions, *Arch Dermatol*, 134(11), 1998, 1401-1404.
6. Singh K K, Tripathy S. Natural treatment alternatives for psoriasis a review on herbal resources, *Journal of Applied Pharmaceutical Sci*, 4, 2014, 114-121.
7. Aghmiuni A I, Akbarzadeh K A. Medicinal plants to calm and treat psoriasis disease, *INTECH*, 2017, 1-28.
8. Saleeby J P. Wonder herbs: A guide to three adaptogens, *Google Books, USA*, 2006.
9. Sahu R. Jain N K, Tiwari P. Herbal remedies: A new era for psoriasis disease, *IJPSR*, 2(3), 2011, 525-533.
10. Lin C C, Lin J M, Yang J J, Chuang S C, Ujiie T. Anti-inflammatory and radical scavenge effects of arctiumlappa, *Am. J. Chin. Med*, 24(2), 1996, 127-137.
11. Evans W C. Trease and evans pharmacognosy, *Saunders Elsevier, New York*, 16th Edition, 2009, 246, 491.
12. Choonhakarn C, Busaracome P, Sripanidkulchai B, Sarakarn P. A prospective, randomized clinical trial comparing topical Aloe vera with 0.1% triamcinolone acetonide in mild to moderate plaque psoriasis, *J Eur Acad Dermatol Venereal*, 24(2), 2010, 168-172.
13. Srinivasan K, Muruganandan S, Lal J. Evaluation of antiinflammatory activity of Pongamiapinnata leaves in rats, *J Ethnopharmacol*, 78(2-3), 2001, 151-157.

14. Singh R K. Anti-inflammatory activity of seed extracts of pongamia pinnata in rat, *Indian J Physiol Phar*, 40(4), 1996, 355-358.
15. Sarma A K, Konwer D, Bordoloi P K. A comprehensive analysis of fuel properties of biodiesel from Koroch seed oil, *Energy Fuel*, 19(2), 2005, 656-657.
16. Kirtikar K R, Basu B D. Indian medicinal plants, *International Publishers, Deheradun*, 2nd Edition, 1987, 717-721.
17. Xuenong Zhang *et al.* The chemical constituents and bioactivities of psoralea corylifolia linn: A review, *Am J Chin Med*, 44(1), 2016, 35-60.
18. Department of Biotechnology, *Lovely Professional University, Phagwara, Punjab 144411, India.*
19. Tanaka Y, Sasaki N, Ohmiya A. Biosynthesis of plant pigments: Anthocyanins, betalains and carotenoids, *Pl J*, 54(4), 2008, 733-749.
20. Zhu C, Bai C, Sanahuja G, Yuan D, Farre G, Naqvi S, Shi L, Capell T, Christou P. The regulation of carotenoids pigmentation in flowers, *Arch Biochem Biophys*, 504(1), 2010, 132-141.
21. Chakraborty G S. Phytochemical screening of calendula officinalis linn leaf extract by TLC, *IJRAP*, 1(1), 2010, 131-134.
22. Chakraborty G S. Antimicrobial activity of the leaf extracts of calendula officinalis (Linn), *Journal of Herbal Medicine and Toxicology*, 2(2), 2008, 65-66.
23. Murti K, Panchal M A, Gajera V, Solanki J. Pharmacological properties of *Matricaria recutita*: A review, *Pharmacologia*, 3(8), 2012, 348-351.
24. Roopashree T S, Dang R, Shobha Rani R H, Narendra C. Antibacterial activity of anti-psoriatic herbs: *Cassia tora*, *Momordica charantia* and *Calendula officinalis*, *Inter Jour of App Res in Nat Pro*, 1(3), 2008, 20-28.
25. Brown D J, Dattner A M. Medical journal article on herbs for common skin conditions, *Arch Dermatol*, 134(11), 1998, 1401-1404.
26. Zahra A, Mohammed A. Evaluation of immunomodulatory effects of five herbal plants, *J Ethanoph*, 72(1-2), 2000, 167-172.
27. Joe B, Lokesh B R. Effect of curcumin and capsaicin on arachidonic acid metabolism and lysosomal enzyme secretion by rat peritoneal macrophages, *Lip*, 32(11), 1997, 1173-1180.
28. Houghton P J, Zarka R, De Las Heras B, Hoult J R. Fixed oil of *Nigella sativa* and derived thymoquinone inhibit eicosanoid generation in leukocytes and membrane lipid peroxidation, *Planta Med*, 61(1), 1995, 33-36.
29. Al Jassir M S. Chemical composition and microflora of black cumin (*nigella sativa* L.) seeds growing in Saudi Arabia, *Food Chem*, 45(4), 1992, 239-242.
30. Bhatia I S, Bajaj K L. Tannins in black-plum (*Syzygium cumini* L.) seeds, *Biochem J*, 128(1), 1972, 56.
31. Chun H, Shin D H, Hong B S, Cho W D, Cho H Y, Yang H C. Biochemical properties of polysaccharides from black pepper, *Biol Pharm Bull*, 25(9), 2002, 1203-1208.
32. Ghosheh O A, Houidi A A, Crooks P A. High performance liquid chromatographic analysis of the pharmacologically active quinones and related compounds in the oil of the black seed (*Nigella sativa* L), *J Pharm Biomed Anal*, 19(5), 1999, 757-762.
33. Dwarampudi L P, Palaniswamy D, Nithyanantham M, Raghu P S. Anti-psoriatic activity and cytotoxicity of ethanolic extract of *Nigella sativa* seed, *Pharmacogn Mag*, 8(32), 2012, 268-272.
34. Shiva Kameshwari M N, Paramasivam G. *Urginea indica* and its role in psoriasis: A Review, *Int. J. of Pharm and Life Sci. (IJPLS)*, 3(12), 2012, 2236-2242.
35. Dhanabal S P, Anand R, Muruganantham N, Praveen T K, Raghu P S. Screening of *Wrightia tinctoria* leaves for Anti-psoriatic activity, *Hygeia J D Med*, 4(1), 2012, 73-78.
36. Chemistry of Forest Products (CFP) Division, *Institute of Wood Science and Technology, Bangalore, Karnataka, India.*

37. Karodi R, Jadhav M, Rub R. Evaluation of the wound healing activity of a crude extract of *Rubiocordifolia* L. (Indian madder) in mice in Mice, *Inter Jour of App Res in Nat Pro*, 2(2), 2009, 12-18.
38. Alternate titles: *Azadirachta indica*, margosa tree, *NIM* by *Melissa Petruzzello*.
39. Priyadarsini R V, Murugan R S, Sripriya P. The neemlimonoids *azadirachtin* and *nimbolide* induce cell cycle arrest and mitochondria-mediated apoptosis in human cervical cancer (HeLa) cells, *Fr Ra Res*, 44(6), 2010, 624-634.
40. Govindachari T R, Suresh G, Masilamani S. Identification of antifungal compounds from the seed oil of *Azadirachta indica*, *Phytoparasi*, 26(2), 1998, 109-116.
41. Mundada A S, Mahajan M S, Gangurde H H, Borkar V S, Gulecha V S. Formulation and evaluation of polyherbal anti-psoriatic, *Pharmacology Online*, 2, 2009, 1185-1191.
42. Saravanakumar A, Krishnaswami Venkateshwaran. Evaluation of antibacterial activity, phenol and flavonoid contents of *Thespesia populnea* flower extracts, *Pak J Pharm Sci*, 22(3), 2009, 282-286.
43. Vijayalakshmi A, Ravichandiran V, Malarkadi V, Nirmala S, Jaykumari S. Screening of flavonoid *quercetin* from the rhizome of *Smilax china* Linn, For anti-psoriatic activity, *Asian Pac J Trop Biomed*, 2(4), 2012, 269-275.
44. Dimitris D, Aggeliki L, Sophia H, Helen S. *Melissa officinalis* ssp. *altissima* extracts: A therapeutic approach targeting psoriasis in mice, *J Ethno*, 246, 2020, 112208.
45. Department of Environment Science, *Graphic Era University, Dehradun, Uttarakhand, India*.
46. Simpson B S, Luo X, Costabile M, Caughey G E, Wang J, Claudie D J, McKinnon R A and Semple S J. Polyandric acid A, a clerodanediterpene from the Australian medicinal plant *Dodonaea polyandra*, attenuates proinflammatory cytokine secretion *in-vitro* and *in-vivo*, *J Nat Prod*, 77(1), 2014, 85-91.
47. Jo B G, Park N J, Lee S W, Yi L W, Kim S N and Yang M H. *Stellerachamaejasme* and its main compound *luteolin 7-O-glucoside* alleviates skin lesions in oxazolone and 2, 4-dinitrochlorobenzene-stimulated murine models of atopic dermatitis, *Pla Med*, 85(7), 2019, 583-590.
48. Hellinger R, Koehbach J, Huber R, Gruber C W, Grundemann C. Immunosuppressive activity of an aqueous *Viola tricolor* herbal extract, *J Ethnoph*, 151(1), 2014, 299-306.
49. Austin H R, Hoss E, Batie S F, Haussler M R, Whitfield G K. Regulation of late cornified envelope genes relevant to psoriasis risk by plant-derived cyaniding, *Bioch Bioph Res Com*, 443(4), 2014, 1275-1279.
50. *Pharmacogn Rev*, 8(15), 2014, 45-51.
51. Rajesh B N, Fleming A, Devada S, Ranvir R, Sundar R. Anti psoriatic effect of *tribulus terrestris* extract by topical application in mouse model of contact dermatitis, *Inter J Vet Sci*, 2(1), 2013, 7-11.
52. Usman H, Abdulrahman F, Ladan A. Phytochemical and antimicrobial evaluation of *Tribulusterrestris* L. growing in Nigeria, *Res J Biol Sci*, 2(3), 2007, 244-247.
53. Kostova I, Dinchev D. Saponins in *Tribulusterrestris* – chemistry and bioactivity, *Phytochem Rev*, 4(2-3), 2005, 111-137.
54. Xu Y J, Xu T H, Zhou H O, Li B, Xie S X, Si Y S, et al. Two new furostanolsaponins from *Tribulusterrestris*, *J Asian Nat Prod Res*, 12(5), 2010, 349-354.

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