Ageratum conyzoides 简体中文 正體中文

System: Terrestrial

Kingdom	Phylum	Class	Order	Family
Plantae	Magnoliophyta	Magnoliopsida	Asterales	Asteraceae

Common name

gobu (English, Gambia), pica roxo (Portuguese, Brazil), berokan (English, Indonesia), gundhaubon (English, India), mahakaua (English, India), celestina (English, Italy), kakkoazami (English, Japan), ruput tahi-ayam (English, Malaysia), imiesu (English, Nigeria), tamasondji bata (English, Nigeria), ageratum (English, Netherlands), huarmi (English, Peru), budbuda (English, Philippines), bulak-manok (English, Philippines), agerato (Italian), kamabuag (English, Philippines), kolokong-kabanyo (English, Philippines), kulong-kogong-babae (English, Philippines), kakalding (English, Philippines), boko-boko-wiwiri (English, Suriname), ya-tabsua (English, Thailand), ya-sap-raeng (English, Thailand), co cut-heo (English, Vietnam), kolokong-kabayo (Tagalog), maile kula (Hawaiian), sogovanua (Fijian), mbotembotekoro (Fijian), mata mothemothe (Fijian), maile honohono (Hawaiian), bouton (French), bahu-bahu (Filipino), songovanua (Fijian), bahug-bahug (Filipino), baume mauve (French), baume (French), baume blanc (French), maile hohono (Hawaiian), herbe de bouc (French), bulak-manok (Spanish), chuva (Spanish), asipukpuk (Pangasinan), ngmak (Palauan), tekote tea (Niuean), sekose sea (Kwara'ae), belohanua (Ibatan), kamabuag (Hawaiian), lau taioti (Samoan), huarmi (Spanish), jambo-serila (English, Gambia), efoe momoe (English, Ghana), maire vaihi (Tahitian), winter weed (English), botebotekoro (Fijian), macela de são joão (Portuguese, Brazil), tae'oti (Samoan), olloowaisiip (Chuukese), mumutung (Chamorro), erva de santa maria (Portuguese, Brazil), mentrasto (Portuguese, Brazil), kakalding (Bontok), maria preta (Portuguese, Brazil), catinga de bode (Portuguese, Brazil), budbuda (Bontok), catinga de barrão (Portuguese, Brazil), erva de são joão (Portuguese, Brazil), erva de são josè (Portuguese, Brazil), picão roxo (Portuguese, Brazil), te'ehosi (Tongan), tropical whiteweed (English), agerato (Portuguese, Brazil), botekoro (Fijian, Fiji), Leberbalsam (German, Germany), zerisson blanc (French), blue top (English), blue flowered groundsel (English), Neela Phulnu (English, India), bandotan (English, Indonesia), camará apeba (Portuguese, Brazil), camará-opela (Portuguese, Brazil), camará iapó (Portuguese, Brazil), erva de santa-lúcia (Portuguese, Brazil), blue Ageratum (English), hwo-hsiang-ji (English, Taiwan), petit pain doux (French), pain doux (French), oochunt (English, Bangladesh), tropic ageratum (English), Phulkuri (English, Bangladesh), mother brinkly (English), macela francesa (Portuguese, Brazil), bouton blan (French), goat weed (English), herbe à sorcier (French), herbe à pisser (French), billy goat weed (English), hierbe de chivo (Spanish), hierba del zorro (Spanish), white weed (English), barba de chivo (Spanish), hierba del perro (Spanish), bouton ble (French), a'amia (Samoan), camará japê (Portuguese, Brazil), azier françois (French), herbe à femme (French), matruço (Portuguese, Brazil)

Synonym

Ageratum latifolium , Car.
Ageratum maritimum , H.B.K.
Ageratum mexicanum , Sims.
Ageratum obtusifolium , Lam.
Ageratum caeruleum , Hort. ex. Poir.
Ageratum coeruleum , Desf.
Cacalia mentrasto , Vell.
Ageratum hirtum , Lam. 1783
Ageratum humile , Salisb. 1796
Ageratum hirsutum , Lam. 1810
Ageratum album , Willd. Ex Steud. 1821
Ageratum cordifolium , Roxb. 1832
Ageratum conyzoides , var *hirtum* (Lam.) DC. 1836
Ageratum suffruiticosum , Regal 1854
Ageratum nanum , Hort. Ex Sch. Bip. 1858
Ageratum odoratum , Vilm. 1866

Similar species

Summary

Ageratum conyzoides is a weed distributed in many tropical and subtropical countries and is often difficult to control. It is an established weed in the Himalayas where several invasion research studies have been conducted in the Shiwalik Ranges. It has been found that *Ageratum* significantly reduces total biomass and species number, that is, biodiversity. It also changes vegetation community structure and modifies the soil regieme.

[view this species on IUCN Red List]

Species Description

Ageratum conyzoides is an erect, herbaceous annual, 30 to 80 cm tall; stems are covered with fine white hairs, leaves are opposite, pubescent with long petioles and glandular trichomes (Ming 1999). It can gain height up to 2 m in the Shivalik hills (Dogra, 2008, in Dogra *et al*. 2009). The inflorescence contain 30 to 50 self-incompatible pink, white or violet flowers arranged as a corymb (Jhansi and Ramanujam 1987, Kaul and Neelangini 1989, Ramanujam and Kalpana 1992, Kleinschimidt 1993, in Ming 1999). The fruit is an achene with an aristate pappus and is easily dispersed by wind (Lorenzi 1982, Scheffer 1990, Kalia and Singh 1993, Lam *et al*. 1993, Paradkar *et al*. 1993, Waterhouse 1993, Kshatriya *et al*. 1994, in Ming 1999). Seeds are positively photoblastic, and viability is often lost within 12 months (Marlks and Nwachuku 1986, Ladeira *et al*. 1987, in Ming 1999). The optimum germination temperature ranges from 20 to 25°C (Sauerborn and Koch 1988, in Ming 1999). The species has great morphological variation, and appears highly adaptable to different ecological conditions.

Notes

Ageratum is derived from the Greek \"*a geras*\", meaning non-aging, referring to the longevity of the flowers and the whole plant (Ming 1999).

Lifecycle Stages
Annual plants appear to have two great advantages: they reproduce early, so they have the potential for very high intrinsic rate of increase, and they can survive adverse condition as dormant seeds in the soil (Crawley, 1997, in Hassan Undated). *A. conyzoides* has the potential to produce many seeds (94,772 seeds per plant) and to shed seeds over extended times (5 to 8 months), as well as its extraordinary physiological plasticity, has enhanced its persistence in arable fields (Ekeleme *et al*. 2005). Invasiveness is enhanced by its ability to emerge in abundance (1000 plants per meter squared) (Anonymous 2000, in Ekeleme *et al*. 2005).
One plant of *A. conyzoides* may produce up to 40 000 seeds, with up to half of seeds germinating (Holm *et al*. 1977, in PIER 2008).
A. conyzoides flowers from July to March in India (Batish 2008). For the plant of equal biomass (both white- and violet-flowered), Hassan (Undated) found that the white-flowered produce more flowers and attract more insect pollinators than violet ones.

Uses
Medicinal: *Ageratum conyzoides* is an annual herb with a long history of traditional medicinal uses in many countries in the world, especially in the tropical and subtropical regions. A wide range of chemical compounds including alkaloids, flavonoids, chromenes, benzofurans and terpenoids have been isolated from this species. Extracts and metabolites from this plant have been found to possess pharmacological and insecticidal activities (Okunade 2002). *A. conyzoides* is widely utilized in traditional medicine by various cultures worldwide, although applications vary by region. In Central Africa it is used to treat pneumonia, but the most common use is to cure wounds and burns (Durodola 1977, in Ming 1999). Traditional communities in India use this species as a bacteriocide, antidysenteric, and antilithic (Borthakur and Baruah 1987, in Ming 1999), and in Asia, South America, and Africa, aqueous extract of this plant is used as a bacteriocide (Almagboul 1985, Ekundayo *et al*. 1988, in Ming 1999).
A crude material isolated from the leaves of *A. conyzoides*, a herb widely used by traditional medicine men for wound healing, is shown to exhibit antibacterial activity against *Staphylococcus aureus in vitro* (Durodola 1977).
It has been found that ingesting *A. conyzoides* can cause liver lesions and tumors. The plant contains the pyrrolizidine alkaloids lycopsamine and echinatine.
Insecticidal: *A. conyzoides* has natural biocide activity that may have agricultural insecticidal use, as shown by several research investigations in different countries. The leaves of the plant reportedly have moth-repellent properties (Pereira in 1929, in Ming 1999). The plant's terpenic compounds, mainly precocenes, with their antijuvenile hormonal activity are probably responsible for the insecticide effects. The affect of *A. conyzoides* on insect larva is to arrest juvenile development; this effect has been seen in *Musca domestica* (fly) larvae, *Chilo partellus* (Lepidoptera, Pyralidae), a sorghum pest, mosquitoes (*Culex quinquefasciatus*, *Aedes aegypti*, and *Anopheles stephensi*)
Essential oil extracts from the leaves of *A. conyzoides* caused significant morality of the maize grain weevil, *Sitophilus zeamais*. Mortality increased with the concentration of essential oil and the duration of exposure (Bouda *et al*. 2001).
Herbicidal: *A. conyzoides* showed strong inhibition of *Raphanus sativus* (radish) germination and growth in a bioassay. The leaves exhibited a greater suppression than the stem and root. The leaves of *A. conyzoides* reduced about 70% of the growth of *Echinochloa crus-galli* var. *formosensis* and completely inhibited emergence of *Monochoria vaginalis* var. *plantaginea*) and *Aeschynomene indica* in calcareous soil condition. Application of *A. conyzoides* leaves caused about 75% paddy weed reduction and increased yield by 14% compared with a herbicide treatment. Three phenolic compounds were identified in the leaves, stem and root including gallic acid, coumalic acid, and protocatechuic acid, and catechin was found only in the stem. *P*-hydroxybenzoic acid was detected in both *A. conyzoides* leaves and stem. Three additional putative allelochemicals were found in the leaves consisting of p-coumaric acid, sinapic acid, and benzoic acid. *A. conyzoides* might be a natural herbicide for weed control in paddy fields to reduce the dependence on synthetic herbicides (Xuan *et al*. 2004).

Habitat Description

Ageratum conyzoides is a herb present in many tropical and subtropical environments. It is a weed of disturbed land in the Pacific island habitats including crops, pastures, plantations, waste land and roadsides (Swarbrick 1997, in PIER 2008). It is also found in clearings, grasslands, forests and along trails (Smith 1991, in PIER 2008).
A. conyzoides grows as a monoculture in grasslands, forests, agricultural, plantations and horticultural fields in India.
A. conyzoides thrives best in rich, moist, mineral soils with high humidity and tolerates shading. It is not tolerant to soils with poor fertility and therefore is only a minor weed on island atolls such as Niue. Hassan (Undated) observed that *A. conyzoides* in the Amani forest, Madagascar, is not found under the canopy but only in areas with light. This seems to suggest that the reproduction and distribution of this species is associated with light intensity. The study showed that the density of *A. conyzoides* was higher in open than in the semi-shaded areas. One study, conducted in the north tropical and south subtropical mountainous zones in the Yunnan Province of China, found that the density of *A. conyzoides* was correlated with the distance of the plant from the road and that its maximum abundance occurred within 4 meters of the road. This supports the model of alien plants invading native plant communities in this part of China from primary colonisation points along road margins (Zhao *et al*. 2008).
A. conyzoides may grow from sea level to at least 2400 meters in altitude (Singh Undated). It is present from sea level to at least 1300 meters in Hawaii (Wagner *et al*. 1999, in PIER 2008) and in Himachal Pradesh the weed is established up to 1800 meters (Dogra *et al*. 2009).

General Impacts
Agricultural: *Ageratum conyzoides* is a weed in many annual and perennial crops and has been reported as host of many crop diseases (Ekeleme *et al*. 2005). Weeds interfere with growth and production of crops and therefore exert significant ecological and economic impacts (Singh *et al*. 2001, Batish *et al*. 2009). For example, in Asia rice yield Asia has been negatively associated with *A. conyzoides* density (Roder *et al*. 1998). Some studies have demonstrated allelopathy in the weed, however, shoot competition for light appears to be a major mode of interference in crops (Ekeleme *et al*. 2005).
Allelopathy: Allelopathy is a type of biotic interference wherein a plant releases bioactive metabolites into the surrounding environment. Growth of nearby vegetation is negatively affected and a selective advantage to the donor plant is provided (Batish *et al*. 2009a). Volatile components of *A. conyzoides* that contribute to phytoinhibition/allelopathy include precocenes and their derivatives monoterpenes and sesquiterpenes. There is much evidence that *A. conyzoides* inhibits germination and growth of other plants through chemicals produced by its root and shoot systems. Fresh leaves and volatile oils of *A. conyzoides* inhibit seedling growth of various crops (Kong *et al*. 1999) including peanut, redroot amaranth, cucumber and ryegrass (Kong Hu & Xu 2002). Studies have shown that shoot extracts of *A. conyzoides* inhibit germination of *Amaranthus caudatus*, *Digitaria sanguinalis* and lettuce (*Lactuca sativa*). Extracts of *A. conyzoides* inhibit germination of wheat and rice (*Oryza sativa*) seeds (Jha & Dhakal 1990, in Ming 1999). The phenolics present in leaf extracts and residues of *A. conyzoides* negatively interfere with the growth and development of wheat (Singh *et al*. 2003, in Batish *et al*. 2009a). Root and shoot length and biomass accumulation of rice are significantly reduced by 18 to 30% when grown in the rhizosphere soil of *A. conyzoides* (Batish *et al*. 2009a). Leaf debris of *A. conyzoides* deleteriously affects the early growth of rice (Batish *et al*. 2009b). Lastly, *A. conyzoides* causes reduction in chickpea (*Cicer arietinum*) growth and nodulation and (Batish *et al*. 2004). Phytoinhibition/allelopathy increases when plants are grown in nutrient-deficient conditions and decreases under fungal infection or aphid feeding (Kong Hu & Xu 2002).
Plant pathogen transmission: Kashina, Mabagala and Mpunami (2003) found that *A. conyzoides* is a weed host and disease reservoir of the *Tomato yellow leaf curl Tanzania virus* near tomato farms in Tanzania (Kashina, Mabagala & Mpunami 2003). *A. conyzoides* is a potentially important TYLCTZV reservoir because it occurs in abundant num¬bers within the tomato farms, it is associated with whitefly vectors, and it is found naturally infected with the virus. Elsewhere, *A. conyzoides* has been identified as host of *Ageratum* yellow vein virus.
Human health: *A. conyzoides* causes allergic reactions in some humans (Negi & Hajra 2007) and may pose a hazard to human health (Kohli & Batish 1996).\r\n
Case Study: Himalayan plant communities: The Shivilak Ranges form part of the North Indian Himalayas, well known for their rich floral diversity. However, *A. conyzoides* is poses a threat to the structure of natural plant grassland and forest communities and the dynamics of natural ecosystem processes (Singh *et al*. Undated A; Dogra *et al*. 2009). The weed replaces native grasses and medicinally important herbs and studies suggest it lowers biomass, biodiversity and creates homogenous monospecific stands (Dogra *et al*. 2009). It also negatively interferes with crop plants (wheat, chickpea, rice, maize, and sugarcane).

Management Info
Integrated management: Experts recommend that future work on invasive plant species in the Shiwaliks in the Himalayas take an IPM approach. The problems associated with invasive species are aggravated due to lack of awareness, insufficient information on the species and its dimensions of the spread (Dogra, Kohli & Sood 2009). Batish (2008) recommends the compiling of comprehensive information on the invasive plant species, determining their possible modes of entry, understanding the biological and ecological attributes of the invasive plants, determining the socio-economic and ecological impact of the invasive plants in the area and disseminating this information to the general public and devising preventive measures for areas free of invasive weeds.
Chemical: Pre-emergence application of simazine, atrazine, diuron, oxadiazon, oxyfluorfen, methazole or metribuzin provides excellent control of this weed. Post-emergence application of 2.4-D controls established infestations (Rao 2000).
On the other hand eco-based, environment-friendly strategies for the effective control of *A. conyzoides* are suggested. Plant extracts of parthenin and eucalyptus (volatile essential oils) may hold promise in controlling *A. conyzoides* (Batish *et al*. 1997, Singh *et al*. 2002, in Batish *et al*. 2004) and some success has already been achieved using these and other natural plant extracts. For example, a study on the allelopathic effect of two volatile monoterpenes (cineole and citronellol) on *A. conyzoides* has revealed their potential for future weed management. Both the monoterpenes severely affected the germination, speed of germination, seedling growth, chlorophyll content and respiratory activity of *A. conyzoides* and after two weeks of exposure, the weed plants wilted. Cineole was the more toxic of the two monoterpenes (Singh Batish and Ravinder 2002).
The addition of activated charcoal, an inert material with high affinity for organic biomolecules, partly ameliorates the negative effects of *A. conyzoides* phenolic allelopathic root residues on rice (*Oryza sativa*) growth (Batish *et al*. 2009).
Field and crop management: Increased fallow length in slash-and-burn rice (*Oryza sativa* L.) production systems of northern Laos decreases weed pressure (Roder *et al*. 1998). Compared with continuous rice treatments treatments with fallow or cowpea (*Vigna unguiculata*) in the previous year had 32% less herbaceous weed biomass and 90% fewer *A. conyzoides*.
The timing of weed seedling emergence relative to the crop is important in planning and optimizing the time of weed control. Ekeleme and colleagues (2005) have predicted seedling emergence of tropical weed species, specifically in low-input and small-scale farms. To control weeds adequately, especially with limited use of herbicides, farmers need to know the timing and extent of weed seedling emergence before and during the growing season. Knowledge of when weeds emerge is equally applicable and beneficial to all forms of weed-management technologies (see: Ekeleme *et al*. 2005).
Research: To respond effectively to invasive species problems quantitative measurements of the impact of invasion on biodiversity are required (Schooler *et al*. 2006, in Dogra *et al*. 2009).

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ALIEN RANGE

[3] AMERICAN SAMOA
[1] ASIA
[4] AUSTRALIA
[1] BANGLADESH
[2] BRITISH INDIAN OCEAN TERRITORY
[1] BRUNEI DARUSSALAM
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[1] VIET NAM
[1] VIRGIN ISLANDS, U.S.
[1] WALLIS AND FUTUNA
[1] ZIMBABWE

BIBLIOGRAPHY

51 references found for **Ageratum conyzoides**

Managment information

Batish, Daizy R., Kaur, Shalinder, Singh, Harminder Pal, Kohli, Ravinder Kumar. 2009a. Role of root-mediated interactions in phytotoxic interference of *Ageratum conyzoides* with rice (*Oryza sativa*) Flora (Jena). 204 (5): Pages 388-395.

Batish, Daizy R., Shalinder Kaur, Harminder Pal Singh & Ravinder Kumar Kohli. 2009b. Nature of interference potential of leaf debris of *Ageratum conyzoides*, Plant Growth Regul 57: Pages 137-144.

Batish, Daizy R., Singh, Harminder Pal, Kohli, Ravinder K., Johar, Vandana, Yadav, Surender. 2004. Management of invasive exotic weeds requires community participation, Weed Technology 18 (Suppl. S): Pages 1445-1448.

Bouda, H., L. A. Tapondjou, D. A. Fontem and M. Y. D. Gumedzoe. 2001. Effect of essential oils from leaves of *Ageratum conyzoides*, *Lantana camara* and *Chromolaena odorata* on the mortality of *Sitophilus zeamais* (Coleoptera, Curculionidae). Journal of Stored Products Research 37 (2): Pages 103-109.

Dogra, K. S., R. K. Kohli & S. K. Sood. 2009. An assessment and impact of three invasive species in the Shivalik hills of Himachal Pradesh, India, International Journal of Biodiversity and Conservation 1 (1): Pages 4-10.

Ekeleme, Friday, Frank Forcella, Dave W. Archer, Okezie Akobundu and David Chikoye. 2005. Seedling emergence model for tropic ageratum (*Ageratum conyzoides*), Weed Science 53: Pages 55�61.

Summary: Available from: http://ddr.nal.usda.gov/dspace/bitstream/10113/2146/1/IND43689668.pdf [Accessed 18 October 2009]

Hawaiin Ecosystems At Risk (HEAR)., 2008. Asteraceae > *Ageratum conyzoides* Images by Forest and Kim Starr

Summary: Available from: http://www.hear.org/starr/plants/images/species/?q=ageratum+conyzoides [Accessed 21 October 2009]

IUCN/SSC Invasive Species Specialist Group (ISSG)., 2010. A Compilation of Information Sources for Conservation Managers.

Summary: This compilation of information sources can be sorted on keywords for example: Baits & Lures, Non Target Species, Eradication, Monitoring, Risk Assessment, Weeds, Herbicides etc. This compilation is at present in Excel format, this will be web-enabled as a searchable database shortly. This version of the database has been developed by the IUCN SSC ISSG as part of an Overseas Territories Environmental Programme funded project XOT603 in partnership with the Cayman Islands Government - Department of Environment. The compilation is a work under progress, the ISSG will manage, maintain and enhance the database with current and newly published information, reports, journal articles etc.

Pacific Island Ecosystems at Risk (PIER).*Ageratum conyzoides*. 2008.

Summary: Available from: http://www.hear.org/Pier/species/ageratum_conyzoides.htm [Accessed 16 October 2009]

Ramadhanil, Sri Soetarmi Tjitrosoedirdjo & Dede Setiadi. 2008. Structure and composition of understory plant assemblages of six land use types in the Lore Lindu National Park, Central Sulawesi, Indonesia, Bangladesh J. Plant Taxon. 15(1): Pages 1-12.

Summary: Available from: http://www.banglajol.info/index.php/BJPT/article/viewFile/911/977 [Accessed 21 October 2009]

Singh, Harminder Pal. Undated. Ecological Impact of Invasive Weed *Ageratum conyzoides* on the Structure and Composition of the Native Communities in Northwestern Himalayas and Insight into the Mechanism of Invasion

Summary: Available from: http://www.apafri.org/forestHealth08/DAY3_Forest%20Health%20Workshop/Harminder_hps-malaysia-final.pdf [Accessed 18 October 2009]

Singh, Harminder P., Daizy R. Batish and Ravinder K. Kohli. 2002. Allelopathic effect of two volatile monoterpenes against bill goat weed (*Ageratum conyzoides* L.), Crop Protection 21(4): Pages 347-350.

Sit, Arun Kumar, Malay Bhattacharya, Biswanath Sarkar & V. Arunachalam. 2007. Weed floristic composition in palm gardens in Plains of Eastern Himalayan region of West Bengal, Current Science 92 (10): Pages: 1434-1439.
Summary: Available from: http://www.ias.ac.in/currsci/may252007/1434.pdf [Accessed 19 October 2009]
Zhao, Jinli, Youxin Ma, Hua Zhu, Hongmei Li, Wenjun Liu, Zengjia Li. 2008. Invasion patterns of seven alien plant species along roadsides in Southern mountainous areas of Yunnan Province, Biodiversity Science 16 (4): Pages 369-380.

General information

Akter, A. and Zuberi, M.I. 2009. Invasive alien species in Northern Bangladesh: Identification, inventory and impacts. International Journal of Biodiversity and Conservation Vol. 1(5) pp. 129-134 September, 2009.
Batish, Daizy R. 2008. Tropical American Invasive Weeds in Shiwalik Range of North Western Himalayas of India: An Assessment of Status and Impact.
Summary: Available from: http://www.apafri.org/forestHealth08/DAY2_Forest%20Health%20Workshop/Daizy_APAFRI_DAIZY_Malaysia-1..pdf [Accessed 18 October 2009]
Batish, D.R., Singh, H.P., Kaur, S., Kohli, R. 2006. Phytotoxicity of *Ageratum conyzoides* residues towards growth and nodulation of *Cicer arietinum*. Agriculture, Ecosystems and Environment 113 (2006) 399�401.
CABI Crop Protection Compendium., 2007. *Ageratum conyzoides* L. 1753
Summary: Available from: http://www.cabicompendium.org/NamesLists/CPC/Full/AGE_CO.htm [Accessed 21 October 2009]
Cao Fei; Song Xiao-ling; He Yun-he; Qiang Sheng; Qin Wei-hua; Jiang Ming-kang., 2007. Investigation of alien invasive plants in Huizhou Mangrove Natural Reserve. Journal of Plant Resources & Environment. 16(4). NOV 2007. 61-66.
Cronk, Q. C. B., 1989. The Past and Present Vegetation of St Helena. Journal of Biogeography, Vol. 16, No. 1 (Jan., 1989), pp. 47-64 (article consists of 18 pages)
Dogra, K.S., Kohli, R.K., Sood, S.K., Dobhal, P.K. 2009. Impact of *Ageratum conyzoides* L. on the diversity and composition of vegetation in the Shivalik hills of Himachal Pradesh (Northwestern Himalaya), India. International Journal of Biodiversity and Conservation Vol. 1(4) pp. 135-145 September, 2009
Durodola, J. I. 1977. Antibacterial Property of Crude Extracts From a Herbal Wound Healing Remedy - *Ageratum conyzoides*, L., Planta Med 32: Pages 388-390.
Encyclopedia of Life (EOL)., 2007. *Ageratum conyzoides* L. Tropical whiteweed
Summary: Available from: http://www.eol.org/pages/468159# [Accessed 21 October 2009]
FloraBase., undated. *Ageratum conyzoides* L. The Western Australia Flora
Summary: Available from: http://florabase.calm.wa.gov.au/browse/profile/13230 [Accessed 21 October 2009]
Global Biodiversity Information Facility (GBIF), 2009. Species: *Ageratum conyzoides* L.
Summary: Available from: http://data.gbif.org/species/13749053 [Accessed 15 June 2010]
Gupta, Nutan, Ashish Anthwal & Abhay Bahuguna. 2006. Biodiversity of Mothronwala Swamp, Doon Valley, Uttaranchal, The Journal of American Science 2 (3).
Hassan, Amel Abdallah. Unknown. Reproduction of *Ageratum conyzoides* depending on light and flower colour. Rahantavololona Vonimanitra Juliana Rasoma, University of Antananarivo, Madagascar.
Hyde, M.A. & Wursten, B. 2009. Flora of Zimbabwe: Species information: *Ageratum conyzoides*.
Summary: Available from: http://www.zimbabweflora.co.zw/speciesdata/species.php?species_id=158650 [Accessed 17 October 2009]
ITIS (Integrated Taxonomic Information System), 2009. Online Database *Ageratum conyzoides* L.
Summary: An online database that provides taxonomic information, common names, synonyms and geographical jurisdiction of a species. In addition links are provided to retrieve biological records and collection information from the Global Biodiversity Information Facility (GBIF) Data Portal and bioscience articles from BioOne journals.
Available from: http://www.itis.gov/servlet/SingleRpt/SingleRpt?search_topic=TSN&search_value=36481 [Accessed 21 October 2009]
Kashina, Boniface D., Robert B. Mabagala and Anatolla A. Mpunami. 2003. First Report of *Ageratum conyzoides* L. and *Sida acuta* Burm F. as New Weed Hosts of Tomato Yellow Leaf Curl Tanzania Virus, Plant Protect. Sci. 39: Pages 18-22.
Summary: Available from: http://www.cazv.cz/2003/PPS1_03/4-Kashina.pdf [Accessed 21 October 2009]
Kato-Noguchi, H., 2001. Assessment of the Allelopathic Potential of *Ageratum conyzoides*. Biologia Plantarum Volume 44, Number 2 / June, 2001
Kohli, Ravinder K., Batish, Daizy R., Singh, H. P., Dogra, Kuldip S. 2006. Status, invasiveness and environmental threats of three tropical American invasive weeds (*Parthenium hysterophorus* L., *Ageratum conyzoides* L., *Lantana camara* L.) in India. Biological Invasions. 8(7). OCT 2006. 1501-1510.
Kohli, RK & Batish, B. 1996. Environmental threat from billy-goat weed *Ageratum conyzoides*. Environmental Research Institute of Michigan (ERIM): Ann Arbor. Vol. 11, pp. 925-929.
Kong, Chuihua , Fei Hu and Xiaohua Xu. 2002. Allelopathic Potential and Chemical Constituents of Volatiles from *Ageratum conyzoides* Under Stress, Journal of Chemical Ecology 28(6): Pages 1573-1561.
Kong, Chuihua, Fei Hu, Tao Xu and Yonghui Lu. 1999. Allelopathic Potential and Chemical Constituents of Volatile Oil from *Ageratum conyzoides*, Journal of Chemical Ecology 25(10).
Ming, L.C. 1999. *Ageratum conyzoides*: A tropical source of medicinal and agricultural products. p. 469�473. In: J. Janick (ed.), Perspectives on new crops and new uses. ASHS Press, Alexandria, VA.
Summary: Available from: http://newcrop.hort.purdue.edu/newcrop/proceedings1999/v4-469.html [Accessed 19 October 2009]
Negi, P. S. & P. K. Hajra. 2007. Alien flora of Doon Valley, Northwest Himalaya, Current Science 97 (7).
Summary: Available from: http://www.ias.ac.in/currsci/apr102007/968.pdf [Accessed 19 October 2009]
Okunade, Adewole L. 2002. *Ageratum conyzoides* L. (Asteraceae). Fitoterapia. 73(1). February, 2002. 1-16.
Ramadhanil; Tiltrosoedirdjo, Soetarmi; Setiadi, Dede., 2008. Structure and composition of understory plant assemblages of six land use types in the Lore Lindu National Park, Central Sulawesi, Indonesia. Bangladesh Journal of Plant Taxonomy. 15(1). JUN 2008. 1-12.
Rao, Vallurupalli Sivaji. 2000. Principles of weed science. Science Publishers.

Roder, Keoboulapha, Phengchanh, Prot and Matias. 1998. Effect of residue management and fallow length on weeds and rice yield, Weed Research 38(3): Pages: 167-174.
Saunders, K., Bedford, I., Briddon, R., Markham, P., Wong, S.K., Stanley, J. 2000. A unique virus complex causes *Ageratum* yellow vein disease, Proc Natl Acad Sci U S A. 97 (12): Pages 6890-5.
Saunders, Keith and Stanley, John. 1999. A Nanovirus-like DNA Component Associated with Yellow Vein Disease of *Ageratum conyzoides*: Evidence for Interfamilial Recombination between Plant DNA Viruses. Virology 264, 142�152 (1999).
Sharma, V. S. 1987. Comments on the identity of *Ageratum conyzoides* L., and *A. houstonianum* Mill. - two naturalized weeds in India, Feddes Repertorium 98(11-12): Pages 557 - 560.
Singh, H.P., Batish., D.R., Kohli., R.K., Arora, V. & Kaur, S. 2006. Impact of the invasive weed *Ageratum conyzoides* in the Shivalik Ranges of the north-western Himalayas, India, Allelopathy Journal 18 (2).
Singh, H P, D R Batish, R K Kohli, V Arora & S Kaur. undated. Impact of the invasive weed *Ageratum conyzoides* in the Shivalik Ranges of the north-western Himalayas, India, *Plant protection and plant health in Europe / BCPC symposium proceedings.*
Summary: Available from: http://p11631.typo3server.info/fileadmin/alte_Webseiten/Invasive_Symposium/articles/S6-36_Singh-046.pdf [Accessed 17 October 2009]
Topp, J. M. W., 1988. An annotated checklist of the flora of Diego Garcia British Ocean Territory. Atoll Research Bulletin 313
Summary: Available from: http://www.zianet.com/tedmorris/dg/atoll_research_bulletin_313_flora_of_diego_garcia_1988.pdf [Accessed 18 October 2009]
USDA-ARS., 2009. Taxon: *Ageratum conyzoides* L. National Genetic Resources Program. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland.
Summary: Available from: http://www.ars-grin.gov/cgi-bin/npgs/html/taxon.pl?103793 [Accessed 21 October 2009]
USDA-NRCS., 2008. *Ageratum conyzoides* L. tropical whiteweed
Summary: Available from: http://plants.usda.gov/java/profile?symbol=AGCO [Accessed 21 October 2009]
Wei-hua, Qin; Wang Zhi; Xu Wang-gu; Jiang Ming-kang., 2008. Investigation and analysis on alien invasive plants in three national nature reserves in Hainan Province. Journal of Plant Resources & Environment. 17(2). MAY 2008. 44-49.
Xuan, Tran Dang, Tawata Shinkichi, Nguyen Huu Hong, Tran Dang Khanh and Chung Ill Min. 2004. Assessment of phytotoxic action of *Ageratum conyzoides* L. (billy goat weed) on weeds, Crop Protection 23 (10): Pages 915-922.