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The Effect of the Aqueous Extract of *Carpobrotus* Leaves on the Larvae of Chironomidae in the Al-Janabi River, Al-Hay District

Lect. Dr. Shaimaa Jassem Hussein Idrees
General Directorate of Education in Wasit, Ministry of Education, Baghdad, Iraq

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Abstract: The use of the aqueous extract of the leaves of the carpus erectus (Conocarpus) on the larvae of the uncut burgundy (Dipteara: Chironomidae), the most dominant in the region, found that the species (Paralaturbornilla) is the most dominant species in the Janabi River/District/Wasit, where it was found that Lc50, Lc90 are (0.238,0.001) ppm, respectively.

Aim of the study:

Selection of the efficiency of the aqueous extract of the leaves of the Carpus plant (Conocarpus eretus) in the study of the sovereignty of the species of Burgos (Diptera: Chironomidae) in the Janabi River/District/Wasit.

Conocarpus erectus:

Classification of the Carpus plant:

Kingdom : Plantae

Phylum : Tracheophyta

Class : Maynoliopsida

Order : Myrtates

Family : Combretaceae

Genus : Conocarpus

Species : erectus

Description of plants:

The Qambertian or organoid family consists of 600 species distributed into 20 genera, of which 11 are found in Africa (Fyhrquist, 2002). Conocarpus is one of its subspecies, which has two species, C. Iacifolius, C. erectus, and the latter are small to medium-sized evergreen shrubs or trees with a branching height of up to 20m. The edges of the leaves are flat, their top is sharp or extended, their dimensions are 5-13cm and 1.8-3.8 cm. Feathery sweating, there is a pair of nectar glands outside the flowers on either side below the blade. Its branches are green or red in color and its short-necked leaves are mutually lanceolate, the cone-shaped fruit is green in color and turns brown at maturity and drought(Al-Shuwaili,2009). The leaves are silver in color, the silver color is due to the presence of soft silver bristles, and its color is not genetically fixed and occurs naturally. or hairless green with smooth leaves (Stephen, 2011).The plant is characterized by its high ability to grow in dry places, as it is considered a drought-resistant plant in which temperatures exceed 47° m (Nelson, 1996), high salt levels and scarce rainfall of not more than 100 mm annually (Chalabi and his group, 2011).

Distribution and Spreading of the Carpus Tree:

(Distribution of Conocarpus erectus and Spread) Carpus tree found in tropical and subtropical regions around the world (Jagessar & Nahla, 2010). Originally from Bermuda, this tree is found on the coasts of South Florida and in the Bahamas.It is sometimes called (mangrove rice), because the plant usually grows indoors from white mangroves. Carpus can be found on beaches as well as in diverse indoor environments such as salt marshes(Stephen et al, 2011).

Chemical Content of Carbs:

The carpus plant (Conocarptus erecytus) contains many microbially active compounds such as claikou ladies, alkalis, phenols, and funnins (Barnabas & Nagarajan, 1988).Several studies have also shown that the leaves of plant species belonging to the genus (Conocarpus) contain many substances, as (Mohammed Reda, 2015) pointed out that the leaves contain fats and terpenes as well as candles that are believed to have a function to protect the plant, and the leaves also contain phenolic compounds, reducing sugars and monosaccharides. Several acids were found to be isolated and diagnosed in the leaves of plants belonging to carpus trees (Misra et al., 1987).The study conducted by (Redha et al, 2011) showed that the histochemical pigmentation of carpus leaves showed a diversity of chemicals in different quantities such as alkanes.

Its environmental functions:

Carpus is a sea-shore tree, the more salt it can resist and save open mud from storm. and helps to increase the stability of forced sand rills in some extends too. For example, carpus also serves as food and cover for wildlife. Due to the low smoke emission and slow-burning characteristic, it is the best fuel for roasting fish. Used as a source of charcoal. Wood is simply thickened, strong in water and has been used for making boats, battleships and other marine constructs (Stephen et al., 2011), while bark is used as tanning agent or more specific as a folk remedy to cure lots of diseases.

Soil remediation of hazardous contaminants is important for safe food production and the clearance of heavy metals from soils relies on on-site and off-site remediation techniques (Moon et al., 2013). Charcoal produced from carbohydrates and organic waste not only isolates contaminated soil, but alters the physical, chemical and biological properties of the soil(Ibrahim et al., 2013).Because of its functional properties after charcoal produced from the carp tree, it is one active substance for hazardous organic and inorganic pollutants, as well as affecting the pH, electrical conductivity and soil moisture (Vithanage et al., 2014).In other studies, the use of the carpus tree as a coagulant with alum and iron trichloride in removing water turbidity and different levels of turbidity, due to the presence of tannin (Hamidawi and Obaidi,2013), and tannin are chemical compounds of a phenolic nature (polyphenols) extracted from wood, leaves and tree foreskin (NigelGraham,2008).

Biological Studies:

Carpus (Conocorpus erectus) has been used for many diseases but only a few of the pharmacological activities described below have been evaluated:

1. Also in diabetes, cardiovascular diseases, inflammation, cancer and aging prevention reduction agents are used as oxidative stress the culmination of free radicals was this match made a young worker who is (Vasi and Austin, 2009). One of them is antioxidants, which are the best compounds to protect an organism against free radicals (Jimenez et al., 2009). The secondary phytochemicals receptor particularly flanoids has been used as therapeutic agents in different medicinal plants to treat wide range of prevalent diseases and especially exhibited significant antioxidant activity (Usoh et al., 2005; Sofidiya et al., 2006).It was investigated that the carp plant has antioxidant properties using (Phosphomoly bdenum) methods and the power of reduction. The antioxidant ability of methanol extracts from fruits using the (Phophomoly bdenum) method showed its high ability as an antioxidant in fruits followed by flowers, roots and leaves, while the reduction power method showed the effectiveness of high reduction power in fruits followed by flowers, roots and leaves (Hameed et al., 2013).

2. Bacterial activity: 2(Hepatoprotective Activity) The liver, a metabolic tool for the biological system, plays an important role in the metabolism and excretion of xenobiotics from the body (Kumar et al. The existence of toxic chemicals (antibiotics, chemotherapy, CCl4, chlorinated hydrocarbons) (Malhotra et al., 2001; Kumar et al., 2011), excessive alcohol intake and autoimmune disorder predominantly contributes to liver cell damage. Liver disorder is one of the most significant health problems liver problem, for which many important medicinal plants of Indian traditional system of medicine are employed (Aniya et al., 2002; Gupta., 2006). Carpus is also one of the plants used to treat liver disorder, by comparing ordinary mice with mice exposed to a toxic substance. An increase in the levels of enzymes secreted by the liver ALt and an increase in urea without affecting protein, albumin and clopulin, treating mice by giving them non-fat methanol extracts extracted from the fruits of the carpus plant, its flowers, stems, flowers and leaves at a dose of 500mg/kg for two weeks, a clear decrease in Alt levels was observed. There is no decrease in urea in the blood and no changes in protein, albumin and clopulin when compared with control mice (Hameed et al. , 2013).

3. Anti-Cancer Activity: Cancer is the abnormal growth of cells in the body that might lead to death. Generally, cancer cells are invasive and they replace normal cells [12 — Thakore et all. Many plants are being used for several years as a natural source of anti-cancer therapy, not since yesterday (Nirmala et al. About 3,500 plant samples have been harvested by the National Cancer Institute from 20 countries and screened for anti-cancer activity of about 114,000 extracts. About 14 out of the 35 drugs used in cancer therapy were natural products and their active constituents derived from such sources (Shoeb., 2006). Carpus plant is one of the plants used as a strong herb to prevent, radiatosyndrom and to much treat cancer. Another study shows that the solar cells located on various parts of the carr plant are highly efficient at destroying Mcf-7, Hep G2 (SRB) cancer cells in vitro 104. (Maryam Bashir et al., 2015).

4. Antimicrobial Activity: Parts of plant carpus were tested as ethanol extracts from leaves, flowers, stems and fruits against Cram positive and negative bacteria and Aside-Fost fungi, all samples show potentials to be active against five organisms (three fungi vokseniy.

Which are: Scharomyces Cerevisiae, Aspergillus niger and Penicillium notatum)). The above results are supported by the findings of Shohayeb, et al.(2013), where Tannins were found to contribute majorly to its activity as an antimicrobial, confirmed in the Acar Disk Diffusion Method.

Primary and secondary metabolic substances in plants

(Primary and Secondary Metabolites of Plant)

The plant manufactures primary and also secondary metabolites having a variety of roles (Croteau et al., 2000). Some of the primary metabolic chemical compounds are:-

Simple Sugars, amino acids, nucleic acids and fats. These are cellular process molecules (Zwenger and Basu, 2008).Hajjawi and his group (2009) defined secondary phytochemicals as chemical compounds produced from primary metabolic compounds during secondary reactions, and the plant can never use them to sustain its metabolic activities necessary for its growth.

(Croteau et al. , 2000) reported the existence of three broad categories of secondary metabolic compounds as natural products:

1- Phenolic compounds.

2-Terpenes.

3-Alkaloids.

The secondary chemicals in the plant work by different mechanisms to affect the life of insect pests, including because they are anti-nutritive, affect the metabolism, are toxic to the insect's tissues, or have a repellent effect on the insect's feeding stages. It also affects the biosynthesis process of chitin, as well as works to prevent the molting and development of larval phases and affects the productivity of the adult tree, that is, it works to prevent the egg-laying process, adult infertility, or the intersex meeting of the same species (Kelany, 2001 ; Alder, 2001).

1- Phenolic Compounds:

Phenolic compound are secondary metabolites, produced by plant Shikimic acid and neptose phosphate through the metabolism of Phenyl Propanicl (Randhir et al., 2004), phenolic substances consisted with benzene rings that contain one or many hydroxyl group from simple phenolic molecules to high polymerized compounds (Velderrain-Rodrigues et al., 2014). Phenolic or polyphenol compounds belong to a major class of natural antioxidants defined by several classes of simple flavonoids, phenolic acids, and complex flavonoids as well as colored anthocyanins (Babbar et al., 2014).

Phenols before they become pigments and are recognized to counter the plant response against Stress defensive Practicesherbivores, also working as antibacterial, antifungal and floral biotic interaction-accelerating Natural Compounds;

Flavonoids, cuumarin acids and phenolic acid are important compounds in oxidation activities (38), so they have an indispensable rolein mitigating the antioxidant activity. SUCH AS BLUEBERRIES, CRANBERRIES, APPLES, GRAPES, PEARS AND THEIR JUICES; MARMALADES and STRAWBERRIES ARE RICH IN PHENOLIC COMPOUND. The oxidation activities of phenolic compounds are due to their hydrogen donating and oxygen scavenging actions (Rice-Evans, 2004).

Flavonoids have an antibacterial activity with their ability to bind on soluble proteins in bacterial cell wall (Doss et al., 2011). Ant virulence: demonstrated in the green tea producing polyphenols, primarily flavonoids, and phenolic acids and acid (), is due to their potent inhibition of key dietary carbohydrate digesting enzyme glucosides α (glucosidaseα;) and amylase α (amylase α). Anti-hyperglycemic effect, improvement in cell function, enhanced insulin secretion of vegetable and dietary polyphenols can change carbohydrates and lipid metabolism (Lawai 2008) by virtue of the potentiality to retard diabetes induced long term complications.

A good number of studies have highlighted the benefits of phenolic compounds; anti-aging, anti-inflammatory and antioxidant (Shukitt-Hale et al., 2008; Abreu-Mieles et al., 2012). Phenolic Compounds — Present in a variety of plant extracts, phenolic compounds are highly reactive molecules that have catalytic properties similar to those found in oxidation reactions. The reduction in the metal ions and the subsequent generation of metal nanoparticles may be due to the presence of total phenolic materials within the plant extract (Nasrollah Zadeh and Sajadi, 2015).

2-Terpenes:

Terpenes Repell Cabbage Butterfly- Role in plant defenses and identification of Lower species) Interco texture terpene fate45 appropriate for leaf chilling499 Law Function RG 60 HG (Mumm et al. 2008/2007 (Girishonson & Dudareva.,., They are low molecular weight and the compounds contain five carbon building blocks of (Iso pentyl disphophates)…………………………(Leitner et al., 2005; Arimura et al., 2008; Milho & Boland., 2012– subst).

Terpenes are common in higher plants (Köllner et al.,2004) and principally synthesized in plant tissues, flowers or occasionally roots(Dudareva et al., 2004). Terpenoids- saponins and essential oils (Al-Khafaji., 2003). Saponins are also toxic to animals with warm blood because this type of saponin combines with fatty substances in the digestive tract and is excreted through the animal into the environment, which makes insects unnecessary for them or the insect will not be used. Saponins are implicated as affecting cholesterol, thus commingling with other operations like endocrine work (Lindroth and Bloomer, 1991). There are terpenes that act as repellents (Maffei., 2010) others as indirect plant defenses through the attraction of arthropods to prey or weed parasites in order to reduce larval feeding (Kessler&Baldwin., 2001; Rasmann et al., 2005; Schnee et al., 2006).

3-Alkaline compounds (ALkabids):

In approx 20 location pf vasculatr plant specias. And low nitrogen molecular weight compounds The porridge group, which includes up to 12 000species with structures shown to defend plants against herbivores and pathogens (Caporale.,1995; Wink.,1999). The utility of alkaloids as chemical stimulants, circulating drugs and toxins (Facchini 2001) is partly in relation to their biological activities. Alkaloid is the other name of alkaline-base containing nitrogen.

Mc Mahon, 1995 reported that they can also be defined as nitrogenous compounds with all the above types of activity; anti-HIV Ags. Besides, also morphine and the alkalic alkaloids such as yerbarin displayed activity against fluctuations and plasmodia (Freiburghaus et al., 1996; Omulakoli et al., 1997). In fact, their activity in the gut and susceptibility to RNA (Phillipson) suggests that most alkaloids are capable of interfering with digestion which may be effective against microorganisms and diarrheas, as well as causing a great deal of toxicity, also among mammals (Robinson., 1980; Harborne., 1988; Hartmann., 1991). Alkaloids are common and wide distributed in seed plants (Angiosperms), particularly in roots, leaves, fruits and exhibit toxic physiological activity. Colorless and invisible, bitter toxic at high temperature will be decomposed to dissolve in organic solvents such as alcohol ether water are not soluble But the their salts are soluble in water and is insoluble in organic solvents (Starry and Jabrasik,1986).

Many authors have noted that alkaloids, toxic and physiologically active in vertebrates and insects, but the effects in the repellent and / or inhibitory for appetitive behavior of some insects as noted from having an acute toxic effect so will fail to feed on them or die shortly after feeding is the lethal kind, as well as deleterious impacts manifesting themselves over longer periods such as affecting growth and survival(Beck & Resse., 1976).

Burgundy larvae:

Chironominae belongs to the family Chironomidae, the order of wings (Dipter), the class of insects (Insect), the arthropod division (Arthropoda), which are the largest invertebrate groups whose larvae have invaded various types of aquatic and semi-aquatic environments (Epler, 2001).

- The larvae of this family reproduce in various natural and industrial aquatic ecosystems, as most of their species are endemic to fresh water flowing in streams and rivers, as well as reproducing in polluted water (Al-Shami et al., 2010).

- Burgos larvae have four roles during their life, and the females lay the egg in the wet cart with decomposing organic matter or in swamps and house water, and they are in the form of a large gelatinous mass on the surface of the water, and each mass contains 50-1000eggs depending on the type and environmental conditions. The eggs hatch after 3-7days to the larval phase, and the presence of gelatinous material surrounding the body of the larvae allows them to remain attached to the river's edge and in its course, and then the newly hatching larvae feed on this material for two days and then turn to feed on organic matter in the water (Seruice, 1980).
- Members of this family were used in environmental studies to assess and estimate the quality of water and determine the level of pollution in water bodies as a result of the discharge of wastewater to it,as the larvae of this family show sensitivity to colorants, which are an intensity factor or pressure factor because they affect the development and growth of larvae, especially the parts of the mouth that lead to deformities (Al-Shami et al. , 2010).
- The Carpus plant has many local names, including Damas, Gulab and Carpus, as well as English names, including Button margrove and Button wood. This plant belongs to the Comberataceae family and its scientific name is Bandeira, 2003 (Conocarpus erects).
- The Carpus plant is characterized by the presence of high concentrations of heavy metals such as iron, zinc, zinc, copper, manganese and cadmium in the leaves of the Carpus plants collected from industrial areas in Ahvaz, Iran. The plant is considered as a vital indicator of the presence of environmental pollution (Ghalomi, 2013).

Materials and Methods of Work:

Ten types of unprotected burgundy larvae have been diagnosed.

1- Collection and Identification of Plant Sample:

Carpus specimen was obtained from the University of Wasit / Faculty of Science. After cleaned of dust and washed well with water, the leaves to be dried were spread over plastic trays on which two latches of other kind was laid for a purpose that will make it dry better at 25m temperature of laboratory while stirred continuously, then after completely acquired dryness prepared it to crush by regular electric grinder and putted in nylon bags stored under room temperature until ready for use (Al-Khafaji,1025).

2- Preparation of the water extract of plants:

Preparation of leaf powder aqueous extract The treatment with the hydroalcoholic plant extract was prepared by putting 20 g dry matter powder of Conocarpus erect leaves and then housed in a glass decanter capacity to 3 500 cm containing 3,200 cm distilled apotized.

Mix the plant material with a blender for half an hour at laboratory temperature. The solution was then filtered with a cloth or piece of gauze to dispose of the plant waste, and the centrifuge was used at a speed of 3000 cycles/minute to obtain a fragrant plant extract.

Put the clear solution in the electric oven at a temperature of 35c°until the extract dries (Harborne, 1978).The base solution (100000ppm) was prepared by dissolving 1g of the extract in 100ml of distilled water in a 100ml beaker and preparing a series of concentrations required for the study: 1,10,100,1000,1000 of plant extract of carpus leaves with the addition of a diffuser: 0.4ml/100ml (Tween-20) (AL-Dabi, 2014).

3- Statistical Analysis:

Using statistical analysis (Log-dose-probitereressionanalysis):

Using U.S. Environmental Protection Agency Software (Who, 2005) to obtain Lc90, Lc50, Confidence limits, and dose-response regression liner.

Results and discussion:

Effect of aqueous extract of the Carpus plant in the third and fourth stages of paralaturbornilla larvae:

The aqueous extract of the leaves of the carpus Conocarpus erectus, has been shown to affect the larvae of the third and fourth stages of the species paralaturbonilla 24 hours after the exposure period of the plant, it was found that the value of Lc50 is (0.001ppm) and the value of Lc90 is (0.23ppm).

He noted (Bowers, 1984) that The losses in larvae can be assumed due to the fact that the plant may contain toxic compounds causing it. A number of plant compounds are involved in the lysis of epithelial cells lining the midgut of insect larvae feeding on these compounds, being responsible for excrete digestive enzymes, processing and removing toxic substances and lead to the death of insects. On the other hand, these compounds may be released in operation with production endocrine process and consequently the growth account disturbs and results to increase insect mortality (Zubbaidi and Halify., 1989). Alcohol extract kills insect larvae efficiently compared to the aqueous extract which can be expect due to that ethanol solvent is more efficient in dissolving the active compounds than water, hence result showed difference polarity in solvents used (Gailliot., 1998).

Nebras et al., 2015 have also reported that the plant extract of carpus leaves inhibit (100%) Ulocadium bortrytia and Alternaria solania. Carpus plants contain secondary metabolic compounds (tannin and phenolic compounds) to inhibit the growth of microorganisms and serve as an antiviral when the coagulation of microbial protoplasm is inhibited by a high concentration.

Table(1):Shows the LC50 values for half of the number Lc50 and Lc90of paralatuerbornilla larvae and the third and fourth stages of the aqueous extract of carpus leaves in vitro.

Lethal concentration (ppm) within 24 hours

Slop±SE* *	**C.L.***	**Lc90**	**C.L.***	**Lc50**	**Species**
0.517±0.0712	0.061-2.023	0.238	<0.0001-0.002	0.001	Paralaturbornilla

*Confidence Limit

* *Slop ±Standered Error

Conclusions

1-The sensitivity of the larvae was paralaturbornilla sp. Conocarpus erectus aqueous extract in Lc50 (0.001ppm) and(0.238ppm).

2-The discharge of wastewater to the Al Janabi River has had a clear impact on the density and type of unprotected larvae of the Burgos and the possibility of using them as good life evidence of pollution.

3-Thetype paralaturbornilla is abundantly recorded in all stations and months of the study, and this indicates the extent of its tolerance to pollutants thrown on the Janabi River.

Recommendations

1-Diagnosis of the active substances in the extracts of the raw secondary compounds of the leaves of the Conocapus erectus plant for the purpose of manufacturing and using them in the fight against the prickly burghen instead of chemical pesticides manufactured to reduce pesticide contamination.

2-Conducting physiological /histological studies to find out the effect of these plant extracts on insect target tissues.

3-Study of toxic compounds in aqueous and alcoholic extracts of the carp plant Conocarpus erectus.

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