

Antibacterial property of *Piper betle* L.

NATURE abounds with raw materials, such as plants, that can be used to provide man's needs for food, clothing, medicine, and crop protection agents. Researchers studied the properties of some plants for pest control. With plants as natural protectants, the global concern for environment-friendly crop protection strategies can be met. Common medicinal plants were studied and screened for antibacterial activity against plant pathogenic organisms that cause diseases in crucifers and potato. One such medicinal plant studied was *Piper betle* L. Results showed that among the 300 plant species screened, *P. betle* maintained a broad spectrum antibacterial activity against all the test pathogens, such as *Ralstonia*, *Xanthomonas*, and *Erwinia*. It

was also revealed that the *P. betle* solvent extract had more superior action than streptomycin. Through this study, a protocol for the fractionation of the plant material was established. The study also revealed that the active compound in *P. betle* is hydroxychavicol. Its mode of action is similar to phenols, which are also anti-microbial agents.

News source: **Philippine Council for Agriculture, Forestry and Natural Resources Research and Development**

For further information, see Lirio, L. G. Antibacterial activity of *Piper betle* Linn. La Trinidad, Benguet: Benguet State University, 2001.

Treating domestic wastewater with taro and aerated constructed wetland

TREATED or reclaimed wastewater may be used for crop and landscape irrigation, groundwater recharge, or recreational purposes. However, treating domestic wastewater is usually expensive.

Researchers studied the potential of introducing aeration and planting of taro in constructed wetland technology to remove pollutants and contaminants from domestic wastewater such as suspended solids, nitrogen, phosphorous, hydrocarbons, and metals. The objective was to provide a cheap and environment-friendly option for treating domestic wastewater.

A box measuring 1.1 m x 2.2 m x 0.6 m was fabricated. Raw domestic wastewater from the septic tank of the researcher's residence was introduced maintaining a volume of 678 L. Twenty-four taro plants were planted in the box. An aerator was placed with an output of 14 L/minute.

Results of the study revealed the following:

- Using taro in an aerated constructed wetland

can treat domestic wastewater.

- The longer the detention time in the constructed wetland, the higher the removal of Biochemical Oxygen Demand (BOD). Mean removal of BOD was 17.76% at 7 days, and 45.01% at 14 days.
- The removal rate for Total Suspended Solids (TSS) was greater at 14 days detention period (17.54%) than at 7 days (33.3%).
- Dissolved oxygen increased from 0-2.58 mg/L at 7 days detention period up to 2.303 mg/L at 14 days detention period.

News source: **Philippine Council for Agriculture, Forestry and Natural Resources Research and Development**

For further information, see Solis, A. B., Deloria, C. and Ilde, B. Treatment of domestic wastewater using aerated taro constructed wetland. WMSU, 2002.

Drying of crumb rubber in air-SO₂ mixture

A S A FIRST step to the utilization of raw coal as an alternative fuel for drying crumb rubber, a research was conducted to study the effect of SO₂ gas on the drying process and rubber quality. The result showed that drying at air velocity of 3 m/second, temperature range of 90-120°C, and SO₂ concentration in drying air up to 0.1% v/v did not influence the drying characteristics. By using the mixture of air + 1% SO₂, the drying time became shorter by about 20-30 minutes. SO₂ at a concentration of 0.1% in drying air functioned well as an antioxidant, i.e., at 90°C of drying temperature. The Wallace plasticity of rubber after drying (Pa) reached 35, and the Plasticity Retention Index (PRI) was 92,1 higher

than when drying air without SO₂ (Pa = 32, PRI = 82,1) was used. The result of the study gave significant indication that raw coal could be used as fuel for drying crumb rubber.

News source: **Indonesian Research Institute for Rubber Technology**

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Use of proper insect control agents to control white-fly in vegetable soybean

VEGETABLE soybean production is now facing a major problem caused by an insect pest, white fly (*Bemisia tabaci*). This insect plays a major role as vector of the Soybean Crinkle Leaf Virus and can cause considerable yield loss in soybean. While application of chemicals can effectively control the insect, this method is harmful to growers, consumers, and the environment. Therefore, integration of chemical use and neem products or bio-agent applications to control white fly was tested at the northern part of the country.

Infestation of 10 white flies per 20 plants was observed at growth stages of V2-V5 and R2-R5 of soybean in the field experiment. Acetamiprid, imidacloprid, and triazophos were able to effectively

control white fly, which resulted in an increase in yield from 111% to 131% compared to 53-65% with carbosulfan, ground neem, neem extract (Instar), neem extract (DOA), and Bt application. The use of non-chemical agents such as neem extract increased soybean yield up to 50% compared to the control, although the yield and net profit were less than those with chemical application. However, yields obtained from non-chemical plots were free of toxic residues, which is one of the major requirements for domestic consumption and export.

For further information, contact Chiang Mai Field Crops Research Center, Chiang Mai, Thailand.

Influence of *Bacillus* spp. culture supplementation through feed or drinking water on the performance of layer chickens

THREE THOUSAND 65-week-old layer chickens were used in this study. The chickens were divided into three groups each of 1,000 birds, and further divided into four sub-groups each containing 250 birds as treatment replication, and distributed randomly. Group 1 were fed a basal diet + growth promoter antibiotic (AB); group 2, a basal diet + 10⁹ cfu of *Bacillus* spp. culture/kg (PB-M); and group 3, a basal diet and 10⁹ cfu of *Bacillus* spp. culture/Liter of water supplemented into their drinking water (PB-A). The trial was conducted for 14 weeks (2 weeks adaptation period, 10 weeks feeding treatments, and 2 weeks post treatment) where the AB group was continually given antibiotic but not supplementation of *Bacillus* spp. culture, as well as the PB-M and PB-A group. During the treatment period, egg production (% HD) and FCR of the chicken supplemented with *Bacillus* spp. culture (PB-M and PB-A) were highly significant (P<0.001), better than those

receiving antibiotic. There was no significant difference between the PB-M and the PB-A groups. The percentage of HD production and FCR during post treatment of the birds supplemented previously with *Bacillus* spp. culture (PB-M and PB-A) remained significant (P<0.001), better than the ones receiving antibiotic (AB). The birds previously supplemented with *Bacillus* spp. culture had significant percentage of HD production and FCR (P<0.01), better than the group which previously received the supplement through their drinking water. It can be concluded that *Bacillus* spp. culture could be used to replace the function of antibiotics as a growth promoter, and can even give a better result.

News source: **Indonesian Animal Production Research Institute**

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