**Appearance**

- **Scientific name:** Cimex lectularius Linnaeus 1758
- **Common names:** Common Bedbug
- **Family:** Cimicidae
- **Order:** Hemiptera
- **Occurrence:** Worldwide
  - The predominant species in many tropical countries is the tropical bedbug Cimex hemipterus
- **Dispersion:** Passive in ‘second hand’ furniture and other fitments, with vehicles or in baggage, less frequent in infested objects

**Importance of Bedbugs as Ectoparasites**

**History**
- **Developed countries**
  - After 1950: Strong decrease because of improved hygiene, extensive application of insecticides and increased awareness of the problem
  - After 1995: Strong increase of the bedbug problems in Europe, North America, Australia and other developed nations because of a reduction in indoor spraying.
- **Developing countries**
  - Up to now: frequent

**Medical Impact**

- **The bedbugs (nymphs and adults) infest humans, pets, rodents but also poultry for blood ingestion.**
- **Symptoms:** Intensively itching welts with 5 to >10mm size which are caused by the saliva of the bedbugs and last for a few days in the majority of cases. Searching for a blood capillary causes the bug to bite repeatedly. The bite itself is not usually felt.
  - In the case of sensitive or allergic persons the bites may cause extensive skin inflammation, asthma, blurred vision and even anaphylactic shock.
- **Main activity:** The bedbugs feed during the night, mostly at dawn every 3 to 7 days at room temperature. The frequency increases near higher temperatures and optimal host conditions.
  - There is no evidence to suggest bedbugs are involved in transmission of pathogens to humans, including the HIV viruses.

**Signs of Infestation**

- During the day the bedbugs rest in very narrow crevices (behind skirting boards, pictures and casings, in light switches, in apertures for cables or pipes, cardboard boxes, in bed frames and mattresses, in chinks of furniture and under detached wallpaper). In the case of heavy infestations an unpleasant sweetish odour occurs, produced by special glands in the bugs. The adult insects are able to survive without a blood meal for up to one year.

**Hiding Places**

- Bedbugs in a bed frame and in a crevice
- Bedbug dropping around a door frame
- Hiding place of bedbugs in the inside of a cushioned seat

**Resistance Management Tools**

- Resistance to commonly used insecticides was recently described from UK, USA and Canada and is suspected in Australia. Resistance management can be achieved by consequent rotation between the different groups of insecticides according to the IRAC Mode of action classification.

**Application Methods**

- Residual sprays applied to furnishings, bed frames, door frames, wall cracks etc.; vacuum; mattress encasements. Non-chemical methods should be combined with the application of insecticides.

**Insecticides Suitable for Bedbug Control**

**Group 1: Acetylcholinesterase inhibitors**

<table>
<thead>
<tr>
<th>Insecticide</th>
<th>Conc. g/L or g/kg*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1a: Carbamates</td>
<td>2.4</td>
</tr>
<tr>
<td>1b: Organophosphates</td>
<td>2-5</td>
</tr>
<tr>
<td>Chlorpyriphos</td>
<td>0.48-0.96</td>
</tr>
<tr>
<td>Malathion</td>
<td>20</td>
</tr>
<tr>
<td>Pirimiphos-methyl</td>
<td>10</td>
</tr>
</tbody>
</table>

**Group 7A: Juvenile hormone analogues**

<table>
<thead>
<tr>
<th>Insecticide</th>
<th>Conc. g/L or g/kg*</th>
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</thead>
<tbody>
<tr>
<td>Methoprene</td>
<td>0.9</td>
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</table>

**Group 13: Uncouplers of oxidative phosphorylation via disruption of H proton gradient**

<table>
<thead>
<tr>
<th>Insecticide</th>
<th>Conc. g/L or g/kg*</th>
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</thead>
<tbody>
<tr>
<td>Chlorfenapyl</td>
<td>5.0</td>
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</tbody>
</table>

**Group 15: Inhibitors of chitin biosynthesis**

<table>
<thead>
<tr>
<th>Insecticide</th>
<th>Conc. g/L or g/kg*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benzoylureas</td>
<td>0.3</td>
</tr>
</tbody>
</table>


**www.who.int/whopes/en/**