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Gum Arabic and Honey Binder for Watercolor Paint

The most common base gum arabic solution is **one part gum arabic powder** mixed in **two parts water**, measured by **volume**. However, for better accuracy and repeatability, we measure by weight.

The following recipe is **not** standard, esp. for cooler and less humid environments. Please refer the website links (at the end) for standard recipes that might work better for you.

Regarding honey: Many recipes use more honey. If you do not use glycerin, you may wish to increase the amount of honey to reduce cracking. We do not use glycerin because we do not have a local source for it. We are working in a very humid, hot environment, so our honey use has been wildly variable.

Equipment

(All equipment should be sterilized in hot water, see notes)

- 150 ml jar with lid for mixing
- 100 ml jar (with eye dropper) to hold the final mixture.
- Funnel
- Very fine tea strainer OR a clean cotton cloth for filtering OR paper coffee filters
- Tablespoon, and syringe or cup for measuring water
- Scale for weighing (optional)
- Sterile spoon or stick for stirring.

Ingredients (by weight)

- 100 g (100 ml) Rain Water
- 50 g Gum Arabic powder
- 17 g liquid Honey (many people double or triple this amount)
- 2 drops clove oil

(Result is approx. 120 ml of gum arabic and honey solution after straining)

Gum Arabic Solution

1. Strain rain water to remove dirt and insects then boil it to sterilize it.
2. Let the water cool down **until you can hold the container it is in.**
3. Measure the water, and then pour it into the clean mixing jar.
4. Pour the measured honey into the warm water. Close the bottle, shake for 1 minute (until the honey is dissolved).

5. Pour the measured gum Arabic powder into the warm water.
6. Close the bottle, shake well, then open it and use the **sterilized** spoon to break up large clumps. Shake for 3 to 5 minutes, until only a very little gum is stuck to the jar.
7. Add the clove oil to the bottle. Shake for 1 minute.
8. **Let the solution sit overnight** in the refrigerator, or the coolest place you can find. In the morning, it will be all liquid.
9. **Next morning**, shake the jar for 2 minutes.
10. **Boil some water**, then **sterilize** the cotton straining cloth, the gum arabic jar, a metal spoon, and the glass part of the eye dropper boiling them in water for 5 minutes. Pour some hot water through your funnel, too. Let the water and tools cool until you can hold the pot.
11. **Strain the gum arabic solution**
 1. Very important! Wash your hands with soap to kill bacteria. Do not touch your face, or anything else, with your hands while working.
 2. Remove the items from the water with the clean spoon and your clean hands.
 3. Prepare by putting the funnel into your glass jar.
 4. Squeeze the water out of the cotton cloth.
 5. Now, hold it firmly by the corners, so that it can be filled with liquid. Pour the gum arabic solution into the cloth (easier if a second person does this)
 6. Bring together the top of the cloth, and **slowly** squeeze from the top to the bottom, pouring into the funnel, and into the glass jar. You will need 1–2 minutes to **slowly** squeeze the solution through the cloth.
12. Label the bottle: “Gum Arabic + Honey Solution” and write the date.
13. Store in a cool place, preferably a refrigerator.

Other “Standard” Recipes

Jackson’s Art has an excellent website page that shows how to make paint. When they refer to “gum arabic solution”, they mean a one part of powdered gum arabic mixed with two parts water (1:2) measured by volume. They say, “60ml of gum Arabic solution, one teaspoon of glycerin, one teaspoon of honey, and one drop of clove oil was decanted into a glass bottle and stirred well.” For example, that means about 60 ml of water mixed with 30 ml of packed gum arabic powder (volume measurement), then strained.

<https://www.jacksonsart.com/blog/2020/09/25/making-handmade-watercolours-with-jacksons-artist-pigments/>

Earth Pigments

This website has a good recipe, too. It uses 1:3 gum arabic mixture, measured by weight (as we do). They use glycerin (although they also have a suggestion for honey).

By Weight:

- 100 grams (3.5 oz) Gum Arabic
- 333g (11.75oz) boiled, distilled water
- 130g Glycerin (optional)

By Volume:

- 2 parts Gum Arabic
- 4 parts boiled, distilled water
- 1 part Glycerin (optional)

They add honey based on the weight of your Gum Solution rather than a volume mix. For example, if creating the gum solution with 100g of gum arabic, use 55g of honey (2.6 tablespoons.) Runny honey weighs 21 g per level tablespoon.

<https://www.earthpigments.com/artists-watercolor-and-gouache/>

Notes

- This recipe seems to work in Uganda, which is very hot and humid.
- Makes about 60-100 ml of solution, depending on how much is lost by straining.
- Sometimes, this solution does not spoil for weeks! Other times, it smells like vinegar in two days. It depends on how sterile you can keep the materials.
- If your paints do not rehydrate quickly enough, or crack too much, try adding more honey.
- To be honest, adding **Glycerin** seems to help a lot. We don't use because we cannot find a local source.
- 1 tbsp is 15 ml ("US Tablespoon")
- 1 teaspoon ("tsp") is 5 ml

Gum Arabic Powder Weight

David weighed one packed tablespoon of gum arabic powder: 1 Tbsp = 15 ml = 10 g

Honey Weights *(US Tablespoons/teaspoons not Imperial)*

Volume	grams	ml
1 tablespoon or 3 teaspoons	21.0 g	15 ml
2 tablespoons	42 g	30 ml
3 tablespoons	63 g	45 ml
4 tablespoons or 1/4 cup	84 g	60 ml